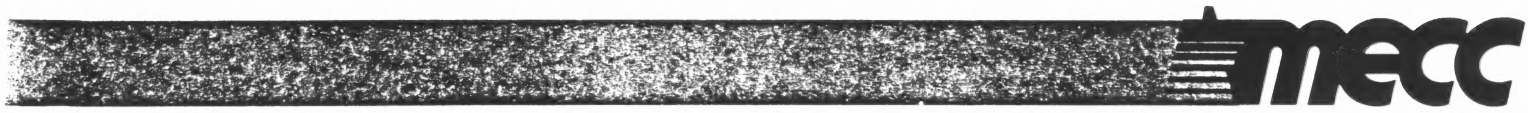

Bluegrass Bluff

Instructional Computing Courseware
for **Apple® II** Series Computers

How to use your MECC binder cover inserts

Tear cover on perforated lines. Place half-page title section in the clear vinyl pocket Ⓐ on the front of the binder. Insert finger-sized title in the clear plastic pocket on the spine Ⓑ.

Bluegrass Bluff

No. A-256
For Apple® II Series Computers
Grades 5-9

As archeologists' helpers at a new dig in Kentucky, students "excavate" artifacts—pottery, jewelry, statuettes, and carvings—from various eras to help them put together a timeline of American history for the past 10,000 years.

Bluegrass Bluff

No. A-256

Bluegrass Bluff

Instructional Computing Courseware
for Apple® II Series Computers

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INTRODUCTION

Bluegrass Bluff is a discovery-learning simulation that capitalizes on the natural inquisitiveness of students. It encourages them to use their curiosity while developing appropriate thinking skills and to learn basic archaeological and historical content.

In ***Bluegrass Bluff***, students are challenged to discover, identify, and determine the age of artifacts. As they explore each layer of artifact-filled soil, students discover a sequence of American cultures. When they discover each artifact, students should carefully observe, record, and compare the artifact's characteristics with those of other artifacts and other cultures. The information collected enables students to draw conclusions and make predictions about artifacts, their characteristics, and where they can be found.

Social studies concepts addressed or related to ***Bluegrass Bluff*** include:

- people have lived in the Americas for a very long time;
- people have lived differently throughout the ages;
- human pre-history and history are divided into units based on the different lifestyles of the people;
- "high civilizations" existed not only in Mexico, Guatemala, and Peru, but also in the area that later became the United States;
- wrong tool selection and digging too rapidly can easily destroy data (artifacts);
- the characteristics of artifacts and the soil in which they are found provide evidence of where and how people lived and can indicate what is called a "culture."

Science concepts addressed by or related to ***Bluegrass Bluff*** include:

- there is a tendency for items to get covered up by dirt as time goes on;
- some items survive in the ground for a very long time while others do not;
- investigators find artifacts in layers and the process of layering is called stratification;
- the youngest artifacts are closest to the surface, and the oldest items are deepest in the ground.

Science process skills developed by ***Bluegrass Bluff*** include:

- observing;
- communicating;
- comparing;
- organizing;
- relating;
- inferring; and
- estimating.

THE PRODUCT AT A GLANCE (continued)

LEARNING OBJECTIVES

When using this courseware, students will practice:

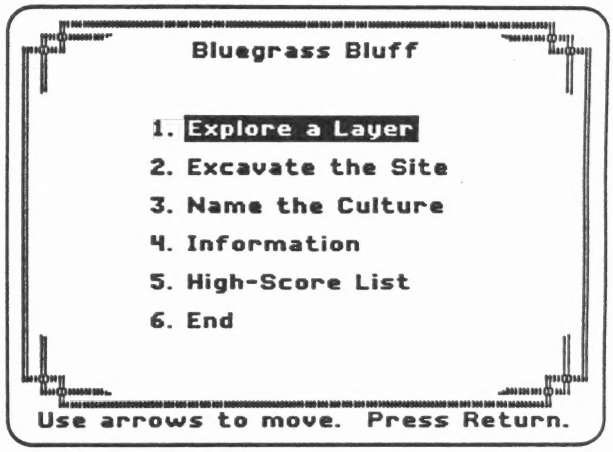
- observing, hypothesizing, forming and testing models, and designing experiments;
- collecting, organizing, and interpreting data in order to solve a problem;
- identifying common artifacts, their possible attributes and uses, and the cultural layers in which they are found;
- predicting the relationship between artifacts and the layers in which they are found; and
- summarizing data and communicating results of investigations in reports (teacher's option).

A QUICK LOOK AT *BLUEGRASS BLUFF*

The information provided in this section includes a brief look at the three instructional programs in ***Bluegrass Bluff*** and an explanation of various menu options and commands. Before beginning the programs, students will benefit from viewing "Instructions" on the Information Menu.

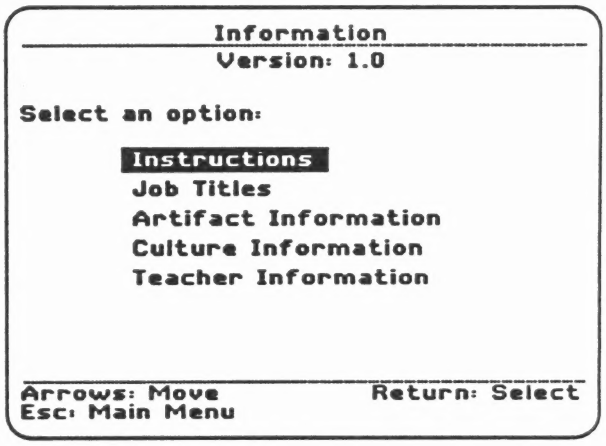
Main Menu

The Main Menu displays six options. Options 1 through 3 are the instructional programs. Option 4 provides information about the programs and readings about the artifacts and cultures. Option 5 provides the list of the ten highest scores made using this copy of the program. Option 6 ends the current session of ***Bluegrass Bluff***. You can select Management Options by pressing Control-A (press the A Key while holding down the Control Key).

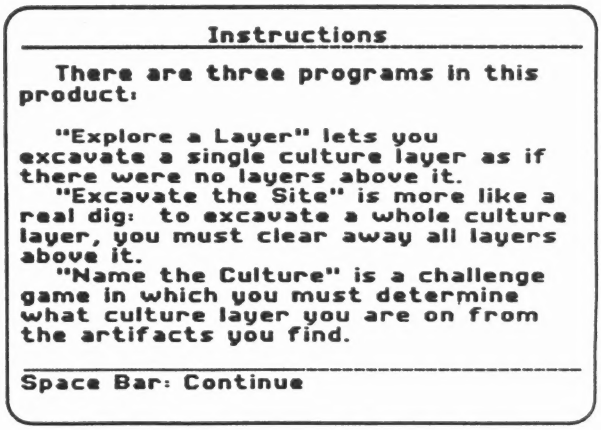


On-Line Information

When you choose Main Menu Option 4, Information, you see the Information Menu, shown here. This menu presents five information options.

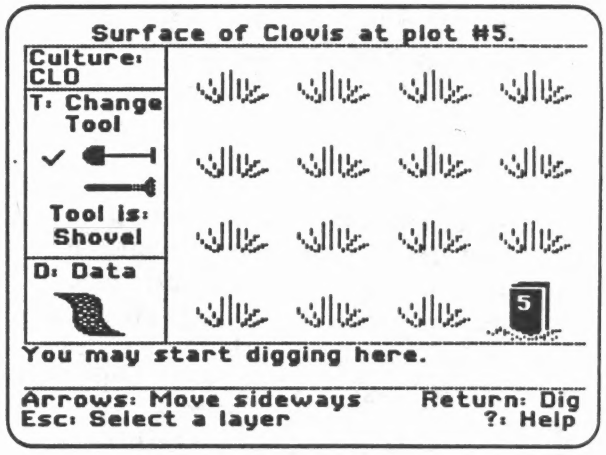


Information Option "Instructions" provides you with directions for using the programs. Part of the information included is . . .


Instructions
There are three programs in this product:
"Explore a Layer" lets you excavate a single culture layer as if there were no layers above it.
"Excavate the Site" is more like a real dig: to excavate a whole culture layer, you must clear away all layers above it.
"Name the Culture" is a challenge game in which you must determine what culture layer you are on from the artifacts you find.
Space Bar: Continue

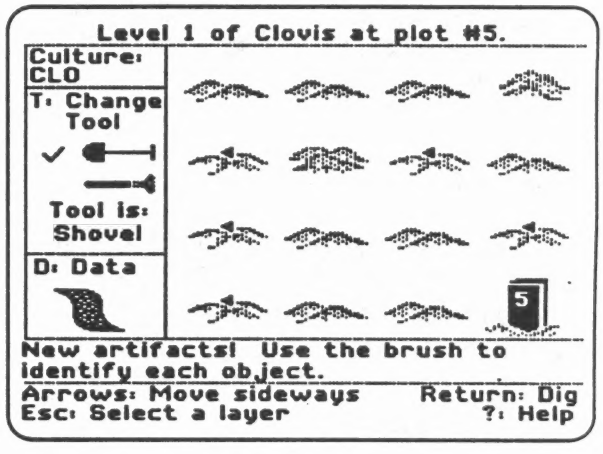
Using the Programs

Most of your activities will center around the artifact dig site. Here you have access to a number of commands to enable you to carry out your investigations.



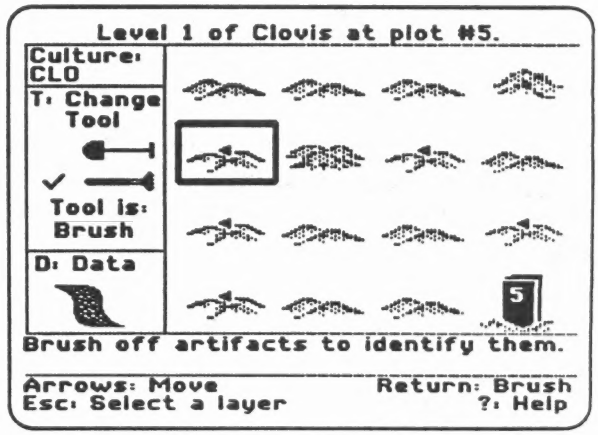
The top line on the screen indicates the chosen culture layer, level, and plot where you are digging. The numbered stake in the lower right corner of the dig field indicates your horizontal position. You can dig at ten horizontal positions or plots.

Begin by pressing the Return Key to "Dig" with a shovel (the default tool). Artifacts clearly show up on the screen as an unidentifiable mark sticking up out of the dirt.



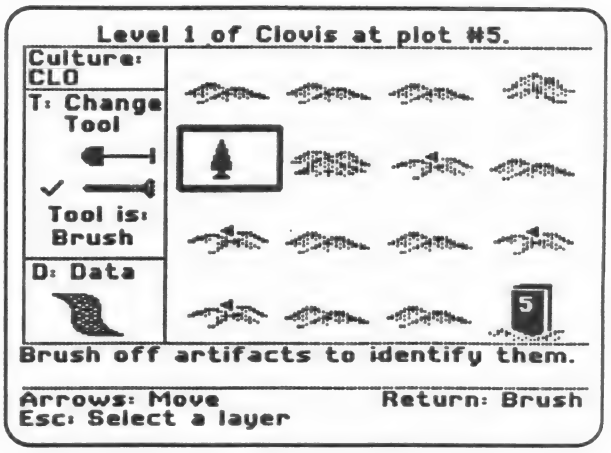
Your task is to discover the artifacts common to each layer and to analyze how the artifacts are related: to the layer in which you find them, to each other, and to time. The purpose of this program is to help you learn about the cultures and their accompanying artifacts.

Use the Tool toggle (the T Key) to exchange the shovel for a brush. Then, with the arrow keys, move the cursor to an artifact that you want to brush off. Each time you dig and find artifacts, you should use the brush to identify the artifacts.

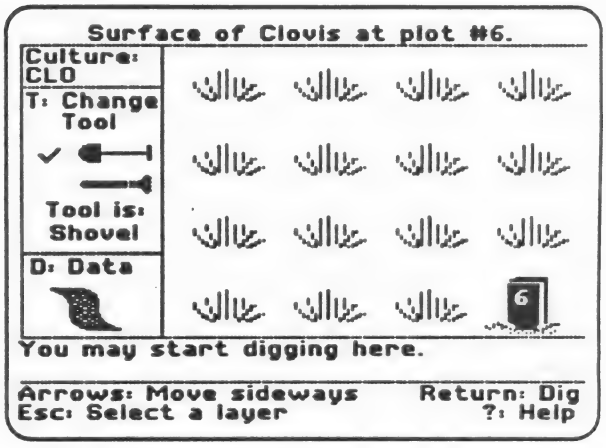


Using the Programs (continued)

If you choose to leave the artifact on the ground, its picture will remain on the dig screen. You can go back at any time, brush off the dust that has settled on it, then read about it, catalog and store it, or leave it there again.



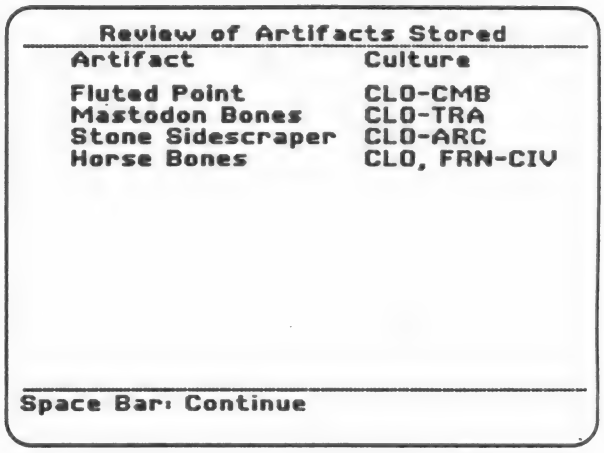
When you return to the dig site, you can use the arrow keys to move to another artifact (if the brush is the selected tool) and brush it off. Or you can press the T Key to select the shovel again. When you have the shovel selected, you can dig down as many levels as are available (one to six, depending on the culture) within the culture layer. Or you can use the arrow keys to move laterally (horizontally) as many as ten times (indicated by the numbers on the stakes). The picture to the right shows another surface plot at stake #6 (the previous artifacts were found at plot 5).



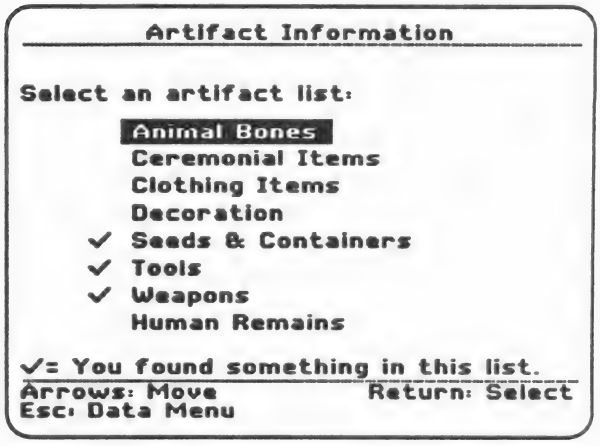
Teacher Hint:
Encourage students to use good archaeological procedure by investigating each layer in an organized manner. Also encourage them to make use of all the options available. These options help students to read, identify artifacts, catalog and store artifacts, organize their data, and analyze their observations.

Using the Programs (continued)

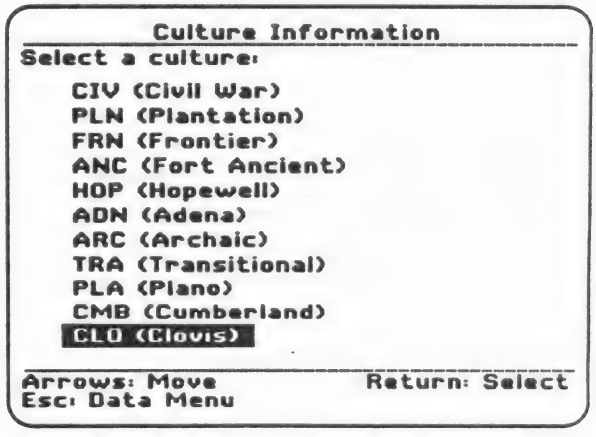
The "Review of Artifacts Stored" screen displays a record of the names of artifacts that you have found in the current investigation. The screen displays the artifacts in the order that you found them.



The "Artifact Information" screen is a list of the different categories or types of artifacts that you can find on the dig site. After you select one of these categories, you can select individual artifacts to read about. The reading looks like the sample provided earlier. The check mark next to items on the lists show you that you have stored an artifact of this type in your digging.

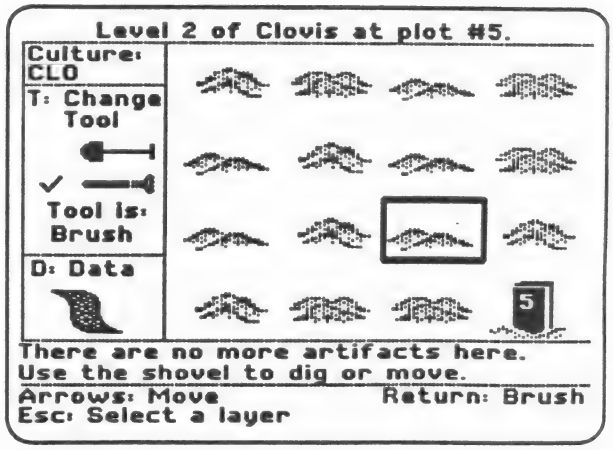


The "Culture Information" screen is the list of all cultures represented at the dig site. It is the menu from which you select the Culture Readings. The cursor will be on the culture you were exploring when you first entered the Data Option.

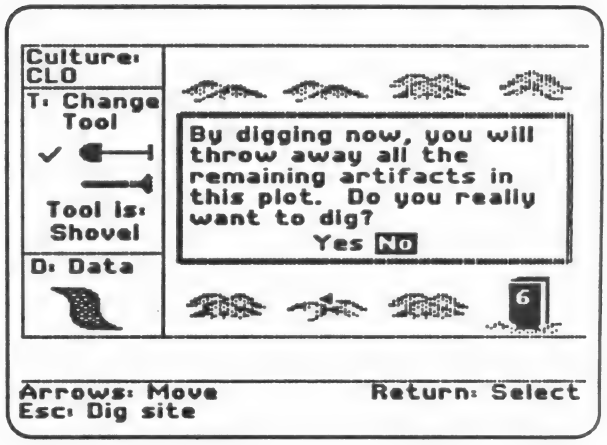


Using the Programs (continued)

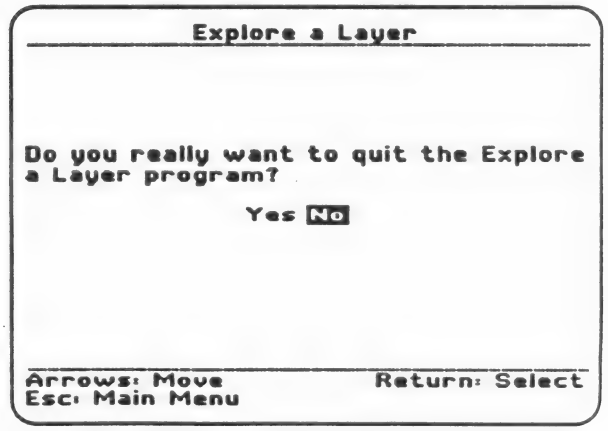
When you are done with the Data Option, return to the dig site. Identify the rest of the artifacts on the screen. The program will notify you when there are no more artifacts at this plot.



Select the shovel by pressing the T Key (Change Tool). If this culture layer has more levels below the level where you are digging, you can dig deeper. If you try to dig when there are still unidentified artifacts at this plot, you will be warned and given the choice to dig or not to dig.

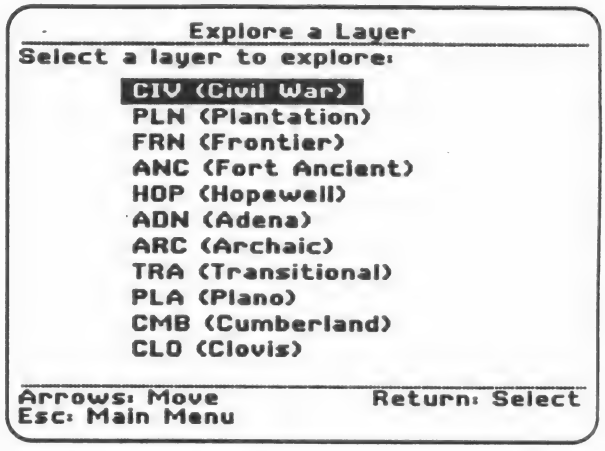


When you wish to quit (or leave and choose another culture to explore), press the Escape Key to leave the program. The program will ask you if you really want to quit at this time. This gives you the chance to correct an erroneous key press.

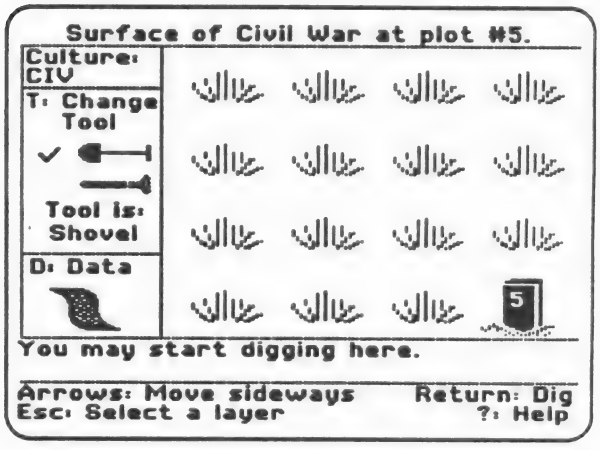


Explore a Layer

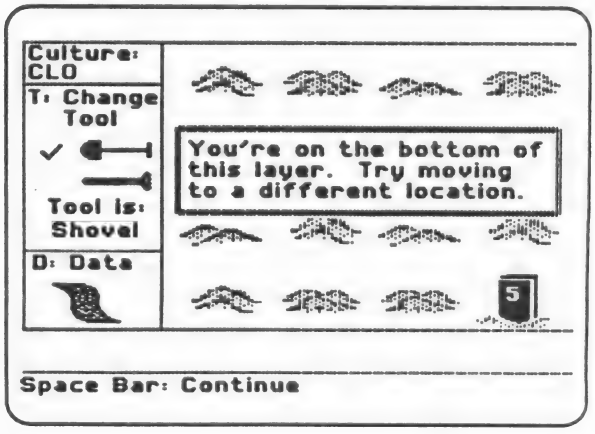
When you choose Main Menu Option 1, **Explore a Layer**, you first see some introductory screens, then you can select a culture layer to explore.



In this program, you will find that everything on the menu column is the same: the T Key for changing tools and the D Key to go to Data ("Last Artifact Stored," "Graph of Last 10 Artifacts Stored," "Review of Artifacts Stored," "Artifact Information," "Culture Information," and "Check Score").

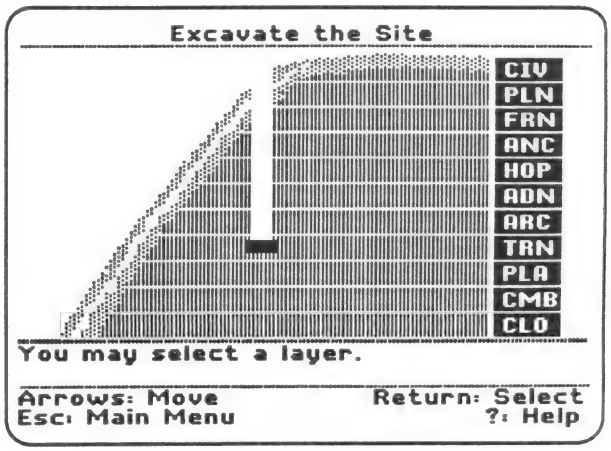


If you continue digging with the shovel, you will eventually get to the bottom of the culture layer. Each culture has between one and six levels (shovel depths) to it. This is a rough measurement of how long that culture actually existed. When you get to the bottom level of a culture layer, you are unable dig any deeper. In order to continue your investigation, you must move to a new horizontal plot (stake number) by pressing the Right- or Left-Arrow Keys.



Excavate the Site (continued)

When you back out of the dig site screens, you go to a new view of the cutaway bluff. Here you can see where you dug. The picture to the right shows that someone simply dug a shaft straight down into the ground.

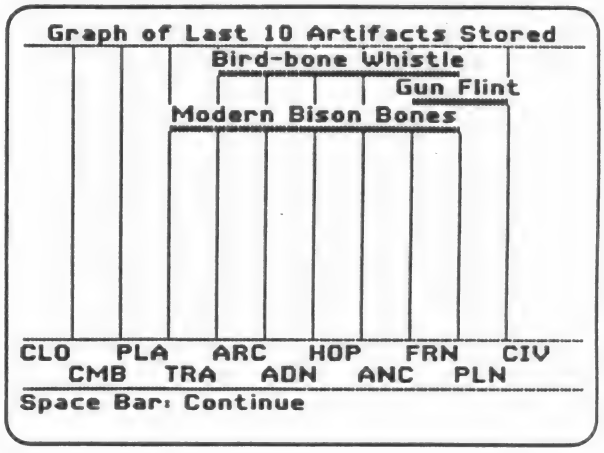


When you want to leave the dig activities, use the Escape Key to end the session and find out how many points you have collected. This works the same way as in **Explore a Layer**. You get a job ranking based on the number of points you collected by finding the artifacts and reading the descriptions. The job ranks used for the product are Beginner (lowest), Digger, Artifact Sorter, Assistant Archaeologist, Senior Archaeologist, and Site Director (highest). The job ranks available in **Excavate the Site**, however, are only from Beginner to Assistant Archaeologist because it is still a learning program, though a little more advanced than **Explore a Layer**.

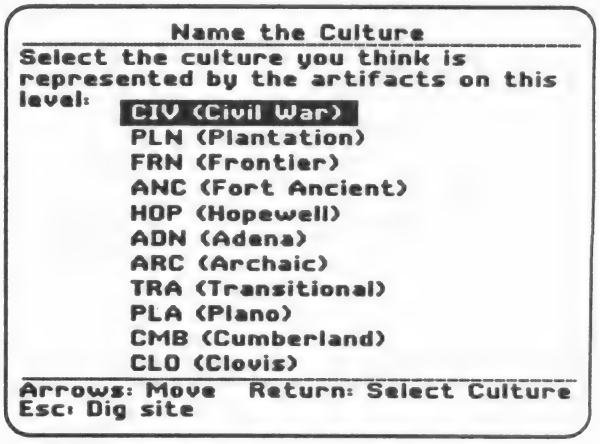
You may also have made the High-Score List, in which case you have the opportunity to enter your initials as in **Explore a Layer**.

Name the Culture (continued)

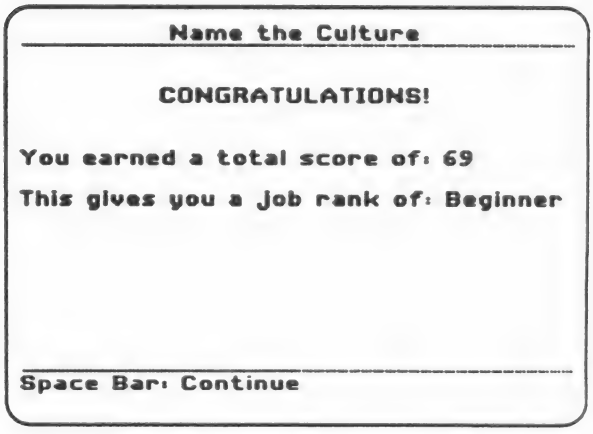
The "Graph of the Last 10 Artifacts Stored" (reached via the Data Option) is one of your best tools for analyzing the culture in which you are working. The graph shows the artifacts and their associated cultures. When you are on a single culture layer and artifacts overlap on this graph by only one culture, the overlapping culture must logically be the one where you are digging. The overlap shown here between the gun flint and the modern bison bone or bird-bone whistle shows that you must be digging in the Frontier culture layer.



To name the culture, press the N Key while you are at the dig site screen. You must select the correct culture from a list of cultures that the program provides.

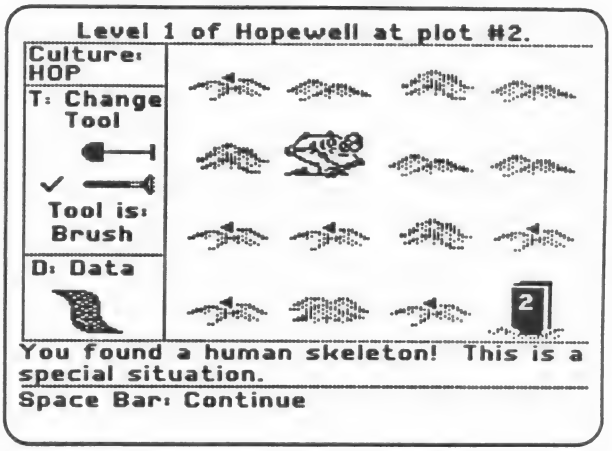


If you answer correctly, the program tells you so and gives you your score and job rank.



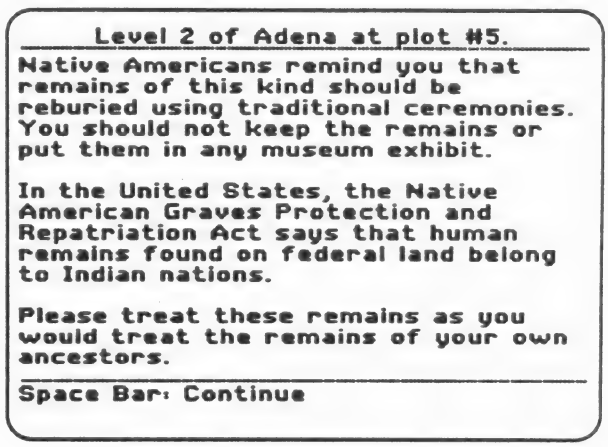
Special Topic: Human Remains

All three programs have one item that you can uncover that must be considered a special situation: human remains. It is especially important to remember that these humans were American Indians. The religious beliefs of their descendants, who are citizens, would be infringed upon if these remains were put on display or treated in any manner other than re-interment with the proper religious ceremonies.



Measures are being taken to correct some of the insensitivities of the past. The 1991 U.S. Federal Law concerning human remains found at digs on government property is one such attempt. ***Bluegrass Bluff*** tries to bring this issue to the attention of teachers and students. You might want to take the time to discuss this issue in detail in your classroom.

In the program, human remains can be found only on the Archaic, Adena, Hopewell, and Fort Ancient layers. You can assume that earlier human remains did not survive the ravages of time (if people were buried here), and that later people, from the Frontier, Plantation, and Civil War periods were buried in cemeteries located somewhere else.


Level 2 of Adena at plot #5.
Native Americans remind you that remains of this kind should be reburied using traditional ceremonies. You should not keep the remains or put them in any museum exhibit.
In the United States, the Native American Graves Protection and Repatriation Act says that human remains found on federal land belong to Indian nations.
Please treat these remains as you would treat the remains of your own ancestors.
Space Bar: Continue

USE IN AN INSTRUCTIONAL SETTING

This part of the manual describes the instructional approach of ***Bluegrass Bluff*** and provides additional information about using the program effectively in an educational setting. Information on the effective use of ***Bluegrass Bluff*** is divided into eight sections: "Preparation," "Using the Programs," "Student Strategies," "Classroom Activities, " "Program Activities," "Student Performance Evaluation," "A Cooperative-Learning Activity," and "Related Activities."

Bluegrass Bluff is designed to be used in conjunction with a textbook chapter or unit and/or other classroom activities on archaeology, Native American history and culture, the archaeological time scale, correlation of artifacts with archaeological time, relative age of layered strata and of artifacts, artifact manufacture, or artifact usage. It can be used at the beginning of the unit to introduce the topic or at the conclusion of the unit to reinforce important principles.

The strength of any instructional software lies in the manner in which it is used in the classroom environment. The emphasis of ***Bluegrass Bluff*** is on presenting students with a problem-solving simulation that promotes discovery learning and reinforces archaeological skills. The program directly supports and complements actual hands-on experimentation in case your school system includes an archaeology unit at the elementary or early secondary level. As a teacher, you can choose to present the concepts by using the computer, conducting hands-on experiments, or by using a combination of these two methods. The supportive and complementary nature of ***Bluegrass Bluff*** gives you the opportunity to create a powerful and flexible instructional environment.

Several suggestions for classroom implementation of the program are mentioned below. The actual selection and sequencing of activities is left to you so that you can tailor the instruction to meet the specific needs of your students. In a similar manner, the amount of direction you give to your students will depend on their skill levels. Some students benefit from a teacher-directed approach, while others function best when allowed to explore and develop their own problem-solving strategies.

Preparation

Although primarily designed for students in grades 5-9, students of other age levels may benefit from effective use of ***Bluegrass Bluff***. Since many of the concepts introduced in ***Bluegrass Bluff*** are presented in greater detail in some later classes, you may want to use these programs to introduce those processes. Some concepts such as artifacts, layering, and the archaeological time-scale should be introduced to younger students before using ***Bluegrass Bluff***. You might prefer to introduce students to the concepts and principles through student-centered activities. Then, after the students have a common set of experiences, you can provide labels for concepts that the students now understand.

Students who are new to ***Bluegrass Bluff*** will benefit from a review of the concepts included and a short demonstration of the program you want them to use. The "Instructions" Option of the Information Menu has a number of topics that may help in this kind of introduction. There are several student worksheets (pages 49-54) that you can use to introduce ***Bluegrass Bluff*** to your students.

USE IN AN INSTRUCTIONAL SETTING (continued)

Classroom Activities

Many student-centered classroom activities can be used to complement and strengthen the instructional objectives and processes presented by ***Bluegrass Bluff***. Some activities can be used as introductory lessons; others can become long-term classroom activities. The selection and order of the activities depends upon your specific classroom environment.

The true value of these activities lies in the ideas, comments, and questions that arise from discussing shared experiences. Allow sufficient time during and after using ***Bluegrass Bluff*** and each additional activity for students to share their observations, approaches, and findings. This interaction can be encouraged by having students work together in cooperative groups and by informing them that discussion sessions will follow the activity.

Discussion Sessions

Engage your students in a discussion of their findings using such questions as:

- What is an artifact?
- What is a culture layer?
- How are artifacts formed?
- How and why do artifacts change?
- How do culture layers help determine the age of artifacts?
- How do artifacts help determine the age of culture layers?
- What can artifacts tell us about how people lived?
- Why did artifacts disappear when they did? Why might people have quit using them?
- Why did new kinds of artifacts appear?

Local Communities and Artifacts

- Try to find where there are some archaeological digs near your locality (your county or state historical society might be a good place to start). If you can get permission to visit a site, or if you can get news articles about a site or maps of it, have your students locate and identify archaeological strata and try to infer the kinds of artifacts that might be found in each.

- Take a field trip to a local museum to observe the kinds of artifacts that can be found in your area.

- Invite a museum curator or archaeologist to speak to your class. If at all possible, try to have an American Indian curator or archaeologist visit; the perspective may be considerably different and quite enlightening. Many "main-line" archaeologists, however, are becoming increasingly more familiar with Native American perspectives of archaeology in the Americas.

I. Explore a Layer (continued)

At some point, the students should begin keeping track of the artifacts they have found. Besides keeping their own notes on paper, they can find a record of the artifacts they have found in the current investigation in two ways. First, they can select Data (with the D Key) from the menu column to see a time-line graph of each artifact stored, a review of each kind of artifact they have stored, and a list of all artifacts in the program. The name of each artifact they have stored will be shown with a check mark. Worksheets "What I Found: Artifacts and Cultures" may help them to organize their own record keeping. Be sure the students understand that the location of the artifacts will be different each time they have a session on the computer. Due to space limitations, the program does not allow saving a scenario, so the locations of artifacts are randomly re-generated every time the students start a new session.

What were the artifacts like and when did their makers live?

Begin with a discussion of the students' experiences with the program up to this point. Ask them to summarize what they have learned and the strategies they have used.

If they have not already begun to do so on their own, encourage the students to become more familiar with each of the artifacts that they find. What do the artifacts look like? How is each artifact like or unlike the others that have been found? Encourage them to take notes and to begin making some informal predictions about what they might find when they dig at any given archaeological period.

As the students repeatedly find the same type of artifact in different archaeological periods, they will begin to get a feel for the length of time over which people used these items. This understanding can be deepened by selecting the Data Option from the menu column and then the "Graph of Artifacts Stored." The ten most recently stored artifacts appear on this chart as horizontal bars above the timeline. The bars extend across the cultural periods during which people used the artifacts. The students can transfer the information from this graph to their "Artifact Graph" handouts. Armed with this understanding, they can now return to the dig site to continue their investigation. They can also refer to the culture readings (also from the Data Option) and assign dates to the cultures on their "Artifact Graph" handouts.

They can begin to gain some understanding of the artifacts they find by selecting the Data Option from the menu column, then select "Artifact Information" and "Culture Information." These selections permit students to read about a specific culture or any of the artifacts available in the program. For artifacts, the students see a picture and a brief description of the artifact they selected to read about. They may also benefit from having access to a set of classroom reference books. You will find a one-page information sheet for each culture and each artifact on pages 55-86.

Worksheets "What I Found: Artifacts and Cultures," "Artifact Graph," "Site Map," "Layer Map," and "Artifact Locations" may help students organize their own record-keeping.

III. Name the Culture

The objective of the following activity is to introduce students to the archaeological skills of collecting, organizing, and analyzing information; drawing conclusions; and predicting by using the program **Name the Culture.**

The students' task is to predict the name of a culture layer in the fewest possible digs based on the artifacts found in it. **Name the Culture** challenges the students' understanding of the artifacts they have found, the culture layers in which they have dug, and the problem-solving strategies they have developed. In this program, students discover that the "Graph of Last 10 Artifacts Stored" does not simply provide some interesting information, but that proper analysis of the information presented there is an essential strategy for their success at identifying the unknown layer. (Refer to the examaple shown on page 19.)

After their successes in the previous two programs, students should be ready to include all the Data Options in their problem-solving strategies.

Can you identify this culture layer?

Lead a brief discussion of their experience in the **Explore a Layer** and **Excavate the Site** programs. Have the students summarize what they may have learned and the strategies they may have found most successful. Encourage them to make use of the understanding they have gained and strategies they have used in the previous programs.

Allow the students to go to the computers and to accept several challenges in this program before engaging them in a discussion. Ask them to define their challenge and discuss what strategies they have used and found successful or unsuccessful when trying to meet that challenge. With the support they have gained from each other, allow them to return to the computers and continue. Try to persuade them to select more difficult levels as they gain experience.

By reading about and analyzing the "Graph of Last 10 Artifacts Stored" in the previous programs, students found that people began using each artifact in different cultural periods. In this program, students discover that it is their challenge to analyze the graphed information to find the one period where the artifacts' existences overlap. When the students discover the single cultural period in which all the artifacts existed, they have discovered the name of the cultural time period in which they are digging. Encourage the students to help one another to improve their analysis and prediction skills.

Student Performance Evaluation

How well students have performed using archaeological skills, thinking skills, and problem-solving skills is often best judged by observing them as they work. The degree to which the students have been successful in each of the programs is, however, an objective measure of how well they have met the primary objectives of this product: using and improving their archaeological skills.

USE IN AN INSTRUCTIONAL SETTING (continued)

A Cooperative-Learning Activity (continued)

Preparation

Time Required:	One class period at the computer lasting approximately 40 minutes. One class period in the classroom for discussion of findings.
Group Size:	Groups of three students. Some aspects of the group discussions are enhanced when the group is heterogeneous in terms of ability levels, gender, etc.
Equipment:	One computer per group.
Materials:	"Team Members Tasks" worksheets "What I Found" worksheets "Artifact Graph" worksheets "Site Map" worksheets "Layer Map" worksheets "Culture Information" and "Artifact Information" handouts

Procedure

Preparation

Provide a brief overview of the ***Explore a Layer*** program to the entire class, explaining the various options.

At the Computer

1. Explain to students that they will work cooperatively to learn about the various cultures that have existed in ***Bluegrass Bluff***. Each group will be assigned to explore only one of the cultural layers. The main goals of this activity are to:

   - learn as much as possible about the culture they have been assigned to explore;
   - share with the rest of the class what they learned about this culture.

2. Assign students to teams of three and inform them of the cultural layer they are to explore. Distribute copies of the "Team Members Tasks," "Artifact Graph," "Site Map," "Layer Map," and "What I Found" worksheets to each group.

   Have teams meet and assign roles among themselves. Take a few minutes to explain the nature of each role and give examples of behaviors that students may exhibit in that role. Explain that periodically students need to switch roles so that everyone can have a turn in each role.

USE IN AN INSTRUCTIONAL SETTING (continued)

A Cooperative-Learning Activity (continued)

Procedure (continued)

- What do the artifacts found tell us about a culture: way of living, beliefs, physical appearance, activities they engaged in, foods, relationships with other groups, etc.
- How are the artifacts from different cultures similar/different?
- What strategies did they use for exploring? Which one was most useful in helping them learn the most about a site?

Note

An activity similar to this can be structured for the **Excavate the Site** program. Assign each group one horizontal plot to excavate (marked by a stake with a specific number). Have them explore that plot down through all culture layers. Then bring the groups together for a discussion of their findings.

USE IN AN INSTRUCTIONAL SETTING (continued)

Related Activities (continued)

An Inventory of Archaeological Resources

State archaeological agencies and historical societies offer a wealth of information and aid for teachers. Have your students write letters for archaeological information. States offer many educational outreach efforts, including speakers, media presentations, publications, museum tours, and libraries.

Lifestyle Comparisons

Have students study pictures of artifacts and infer from them where and how people used the artifacts. Have them compare artifacts to those of present tools and utensils and compare how they are different and how they are alike. Expand the discussion to the differences in manufacture. What can be inferred about people and how they live from their tools and utensils?

Be careful of inferences here. Anthropologists have come to realize that the so-called "primitive" lifestyles did not require many hours of drudgery each day. In fact, the typical stone-age people only worked about three to four hours each day, and much of that was not hard work at all. You can use this information as a lead-in to a discussion of different lifestyles. There are a number of interesting facts you can bring into the discussions:

- There was considerably less stress in life then, thus less heart trouble, ulcers, etc.
- Extended families stayed together because there was less mobility, less chance that someone would want to or be able to move away. As a result, there were always aunts, uncles, and grandparents around to share the work and the childcare burdens. Work was usually done in groups, especially the "women's work" of cooking, cleaning, washing clothes, gardening, preparing hides for clothing and lodges, watching children (which older children often did), etc. Working together helped to pass the time, relieved the burden of work (because there was always someone to talk with), and taught the next generation what had to be done.
- At the time of marriage, many American Indian cultures required the man to move to the location of the wife's family so that, if he died on the hunt or in warfare or if there was a divorce, no children of any age would be required to move away from relatives and friends when their mother returned to her family. If the wife died, the man often married (or had already married) one of her sisters and stayed where he was. Children were never torn from their family support structure.

BACKGROUND INFORMATION

The Nature of Artifacts

Artifacts are visible evidence of early human life preserved in the earth's soil. They can be exposed to view either by natural events (such as erosion) or by digging. For many people, the word "artifact" brings to mind the image of "arrow heads," but many other kinds of artifacts can be found as well. Artifacts include ancient sea shells, tools, ornaments, and even the discolorations in the dirt by the rotting of timbers once used to hold up dwellings.

People created artifacts, which were either lost or discarded and then covered in a layer of leaves, grass, mud, sand, or other sediment. Different people often came to the same location to live. If a place was good for early people, it was usually good for later people. (Discuss how many of today's cities and towns are where an Indian town or village was once located.) If the item contained hard parts, such as a stone or a shell, the remnants of those hard parts may be all that remain. The softer parts, a wooden shaft or a piece of cloth, rotted away to nothing. Under the very best circumstances, some evidence of softer structures, such as the discoloration of soil from rotted wood, may be preserved. Some old pieces of cloth have been preserved due to the leeching of certain copper compounds into the threads from adjacent artifacts.

Many Native American people insist they have been on this continent forever, that they were put here by the Creator. Many anthropologists insist that Indian peoples came here over a land bridge from Asia, left dry by all of the water deposited in the glaciers of the most recent Ice Age. These anthropologists dispute the actual dates of the arrival of people here and have been forced to push their dates back in time with each additional finding at new archaeological sites. But there is general agreement that people did come to the Americas from Asia.

A major problem with proving when people first came here is that most environments do not permit many artifacts, especially human remains or other datable proofs of human habitation, to survive for extremely long times. Another problem is that until the 1950s there were no scientific dating tests that could provide any accuracy. Real dates cannot be calculated simply through using stratification. Today archaeologists generally agree on the accuracy of measuring carbon-14 residues, which permits dating for as far back as 30,000 years ago. Newer tests enable the measurement of other radioactive materials and now provide tools for obtaining accurate dates considerably earlier than possible with carbon-14. Some people (though not many specialists in archaeology and geology) insist that these tests still do not provide any dating certainty.

At one time, anthropologists were certain that Asians crossed the land bridge around 10,000 or 12,000 BCE. There now seems to be proof that people were already in South America long before 18,000 BCE and that other people lived in New Mexico around 35,000 BCE. There are some indications, though no proof, that people were in the Americas about 50,000 years ago. If such a date were true, people must have come here by boat or over an extremely early land bridge. (We know of two other land bridges that existed around 68,000 BCE and 168,000 BCE.)

While the first "habitation" of Bluegrass Bluff began around 10,000 BCE, it does not necessarily follow that the first humans really arrived in the Ohio River Valley area at that date.

Archaeological Time (continued)

In the Southwestern United States there were the following major cultures:

Mogollon (moh-goh-YOHN),
Hohokam (HOH-hoh-kahm),
Sinagua (seen-AH-gwah),
Fremont,
Patayan (pah-TAH-yahn), and
Anasazi (ah-nah-SAH-zee) cultures.

In Mexico, the most important cultures included:

Olmec (OHL-mek),
Teotihuacan (tay-oh-tee-hwah-KAHN),
Zapotec (sah-POH-tehk),
Totonac (toh-TOH-nahk),
Maya,
Toltec (TOHL-tehk),
Mixtec (MEES-tehk), and
Aztec.

The major South America cultures were:

Chavín (chah-VEEN),
Paracas (pah-RAH-kahs),
Nazca (NAHS-kah),
Mochica (moh-CHEE-kah),
Lake Titicaca (tee-tee-KAH-kah) - Tiahuanaco (tee-ah-wah-NAH-koh) - Huari (WAH-ree) grouping,
Chimú (chee-MOO), and
Inca.

Investigators originally discovered and dated these periods in the late 1800s and early 1900s, before there were any reliable ways to determine the exact ages of the cultural artifacts. They used the sequence of layers and the imbedded artifacts as guides. Twentieth-century archaeologists, helped by physicists, chemists, and biologists, developed several methods of radioactive and biological dating. Unlike the early investigators, we now have some accurate ages for the various cultures. Some scientists, however, still quibble over the exact boundaries between certain periods, so different books may use slightly different numbers.

FOCUS OF THE MODEL

It is important to remember that ***Bluegrass Bluff*** is a simulation, which, by design, cannot convey all aspects of reality. Simplifying all the possible variables that can be found in reality enables the product to focus the students' attention on the aspects defined by the instructional objectives. The simplified nature of the model makes it easy for young students to understand the concepts and principles involved. But it can also lead to certain misconceptions. After your students are familiar with the program, you may wish to discuss these limitations with them.

1. ***Bluegrass Bluff*** displays culture layers from many archaeological periods. It is very unusual to encounter a site in which there are so many archaeological periods present. Generally, only a few archaeological periods are present at a single location.

2. All the culture layers in ***Bluegrass Bluff*** are clearly divided and labeled. In a real situation, the boundaries between the archaeological periods are seldom as obvious. Very few locations display such obvious stripes or striations, and many may have striations that bear no correlation to the boundaries between periods.

3. All the culture layers in ***Bluegrass Bluff*** are uniform and horizontal. Cultural layers are not always found in flat, horizontal layers. People lived on hillsides and stream banks, and the layers were originally deposited in correlation with the land where the people lived. Furthermore, these layers may have subsequently been deformed by erosion and earthquakes, and such deformation is normally uneven.

4. ***Bluegrass Bluff*** models the principle of uniformity; that is, the youngest layers appear at the top and the age of the culture layers gradually increases as the digger moves down to the bottom. In a real site, previous peoples may have also dug into the ground for burials, dwelling construction, or a number of other reasons. This could mix artifacts from one culture with another at the same level.

5. The cultural layers in ***Bluegrass Bluff*** are relatively thin and have regular thickness, though some effort has been made to overcome this by having a different number of "levels" within the layers. The thickness of soil deposited at different locations and during different periods may vary considerably.

6. The 42 artifacts depicted in ***Bluegrass Bluff*** actually are a very small number of the real artifacts that may have been present at the site.

7. Many archaeological sites have bedrock very close to the surface. The bedrock at ***Bluegrass Bluff*** is consistently ten horizontal plots in from the side of the bluff. Such consistency, of course, is very unrealistic.

8. Human remains in ***Bluegrass Bluff*** are found only on the Archaic, Adena, Hopewell, and Fort Ancient layers. You can assume that earlier human remains did not survive the ravages of time (if people were buried here at all) and that later people—from the Frontier, Plantation, and Civil War periods—were buried in cemeteries located somewhere else.

A Framework for Thinking

The components used in thinking are referred to as *core thinking skills*. This framework defines those skills that appear in the repertoire of the model learner. Each skill selected is documented in research as important to learning or thinking, is teachable, and is valued by educators as important for students to learn.

The core skills of the ASCD framework are listed and defined below with examples of applications within ***Bluegrass Bluff***. The skills are neither discrete nor hierarchical. In fact, individual skills draw on other skills and can be used repeatedly in the thinking process. The selected examples are not exhaustive but highlight ways in which these thinking skills are used in ***Bluegrass Bluff***.

Source: *Dimensions of Thinking*, Association for Supervision and Curriculum Development (ASCD), 1988.

Definition of Core Thinking-Skills Categories	Core Thinking-Skills Components	*Bluegrass Bluff* Application
Focusing Skills allow students to attend to selected pieces of information and ignore others. Focusing occurs when students sense a problem, an issue, or a lack of meaning.	**Focusing Skills** • Defining Problems • Setting Goals	In ***Bluegrass Bluff***, students assume the role of helpers at a fictional new archaeological site at Bluegrass Bluff, Kentucky. They are challenged to discover, identify, and determine the age of artifacts by investigating the strata of soil in which the artifacts are found.
Information-Gathering Skills involve obtaining information and clarifying issues and meanings through inquiry.	**Information-Gathering Skills** • Observing • Formulating Questions	Coupling observation with record-keeping, students are encouraged to maintain a written record of their observations. Observations may include the name of the artifact, the layer in which it was found, a drawing, and a description of how the artifact was used by a particular culture.
Remembering Skills are those activities or strategies that students consciously engage in to store and retrieve information from long-term memory. Activating prior knowledge falls under this category.	**Remembering Skills** • Encoding • Recalling	The knowledge and understanding gained in the **Explore a Layer** program is applied to **Excavate the Site** as students explore the relationships between artifact types and cultural strata and to **Name the Culture** as students identify a cultural layer from a set of artifacts they find.

TEXTBOOK CORRELATION

Bluegrass Bluff is designed to be directly integrated into your normal elementary history lessons. The following charts correlate the instructional objectives and processes of ***Bluegrass Bluff*** to specific chapters and units in a number of popular high-school textbook series. By referring to these charts, you can create lessons that directly relate to your classroom activities.

SENIOR HIGH-SCHOOL LEVEL

Addison-Wesley Publishing Company: King, Marvin, Weitzman, Dwiggins, *United States History*

Chapter	Page(s)	Concepts
1	3-9	First Americans, diversity

D. C. Heath and Company: Bailey, Kennedy, *The American Pageant*

Chapter	Page(s)	Concepts
1	4-8	Native Americans

Ginn and Company: Boorstin, Kelley, *A History of the United States*

Chapter	Page(s)	Concepts
1	8-10	tribes, diversity

Chapter	Page(s)	Concepts
1	3-10	First Americans, diversity

Harcourt Brace Jovanovich, Publishers: Todd, Curti, *Triumph of the American Nation*

Chapter	Page(s)	Concepts
1	3-10	original people, diversity
4	65-68	Indians—clash of differing cultures

TEXTBOOK CORRELATION (continued)

The following correlations are for junior high-school textbooks. The chapters listed in these correlations not only reinforce instructional material appropriate to ***Bluegrass Bluff***, but also extend into information beyond that covered by ***Bluegrass Bluff***.

PRIMARY/JUNIOR HIGH SCHOOL LEVEL

Follett Publishing Company: Buggey, *Our United States*

Chapter	Page(s)	Concepts
2	50-81	First Americans, diversity, time line

Follett Publishing Company: Joyce, Houston, Gross, Lee, *Exploring Our World: Latin America and Canada*

Chapter	Page(s)	Concepts
2	38-39	ancient peoples, artifacts
	40-61	cultural diversity—Eskimo, Blackfoot, Maya, Aztecs, Inca
	62-63	archaeology

Follett Publishing Company: Lee, *Exploring Our World: Eastern Hemisphere* (6th-7th Grade)

Chapter	Page(s)	Concepts
2	42-58	cultural diversity
2	44	work of the social scientist: the anthropologist
3	76-77	principle of ancient sites being buried
3	77	work of the social scientist: the archaeologist

Scott Foresman and Company: Buggey, Danzer, Mitsakos, Risinger, *America! America!*

Chapter	Page(s)	Concepts
2	26-43	First Americans, layering, archaeologists, artifacts, cultures, diversity
3	44-62	Native American cultures, diversity
5	103	time lines

What I Found: Artifacts and Cultures

Name _____

	Artifact Name	Type of Artifact (weapon, decoration, ceremonial, etc.)	Culture	Age
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				

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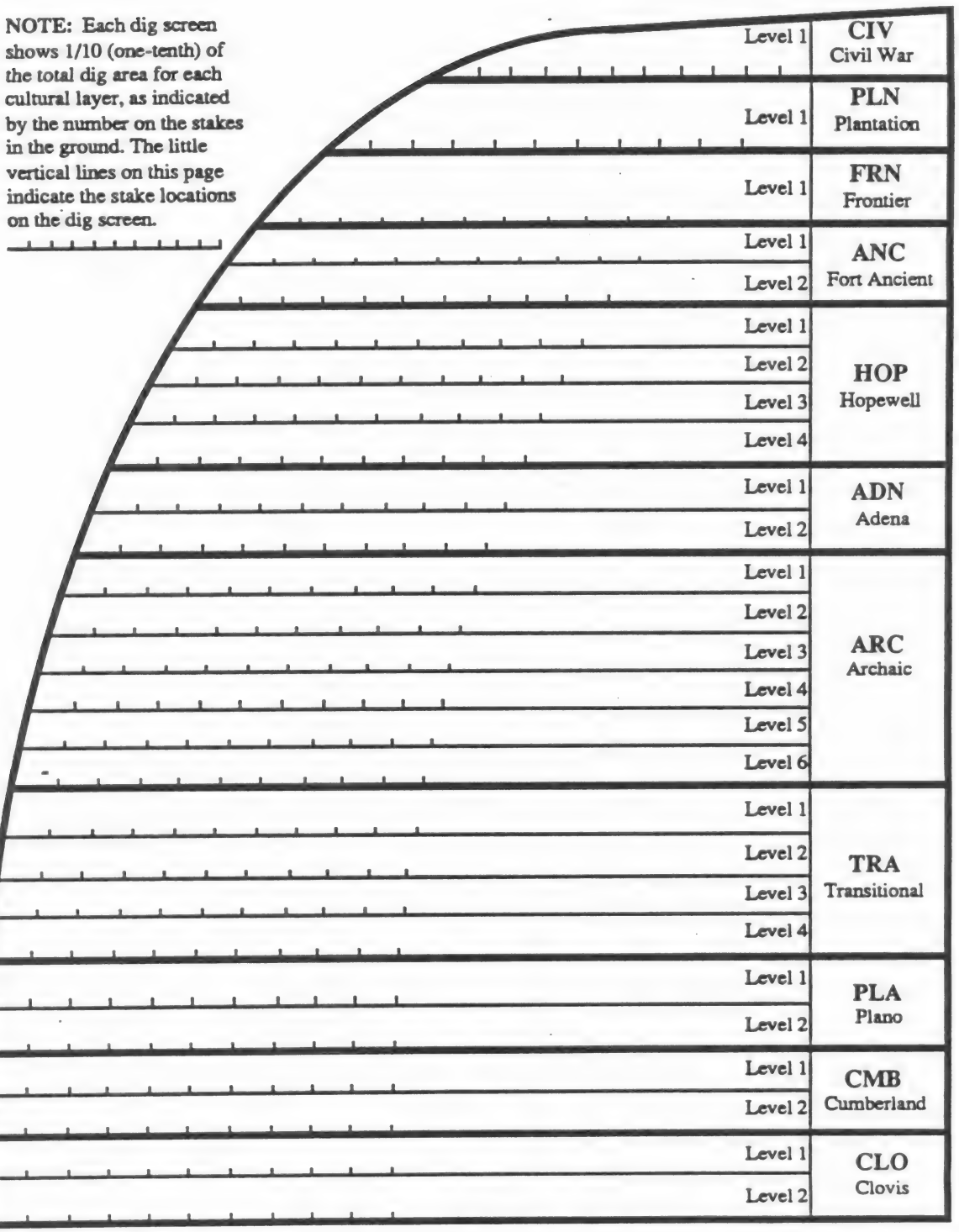
Site Map

Name _____

NOTE: Each dig screen shows 1/10 (one-tenth) of the total dig area for each cultural layer, as indicated by the number on the stakes in the ground. The little vertical lines on this page indicate the stake locations on the dig screen.



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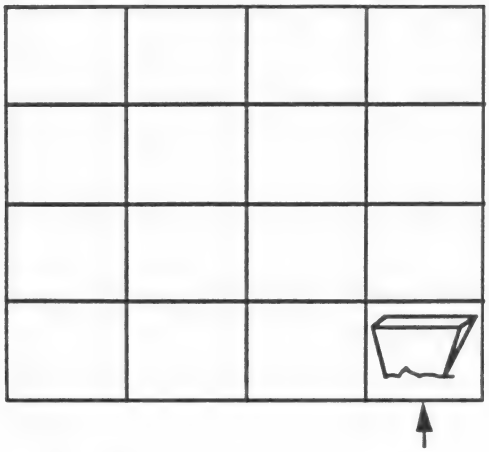
Artifact Locations

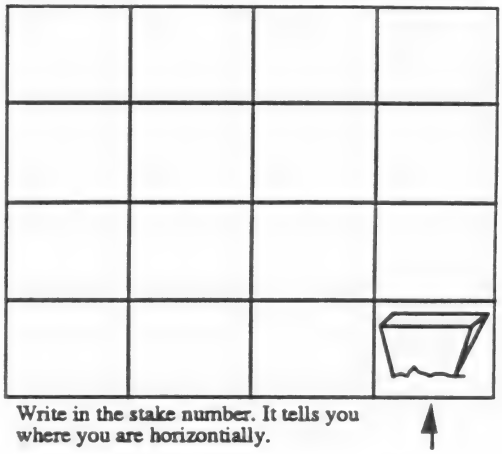
Name _____

Culture Layer: _____ Level: ____



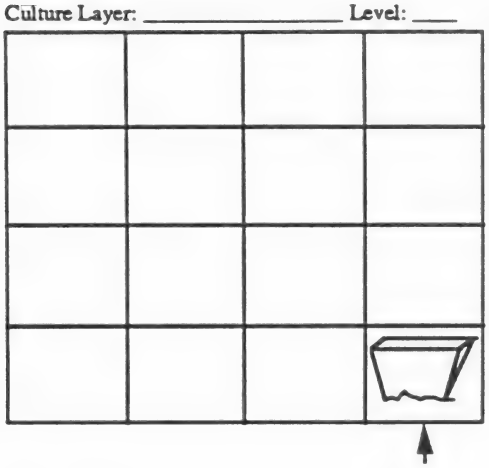
Write in the stake number. It tells you where you are horizontially.

Culture Layer: _____ Level: ____



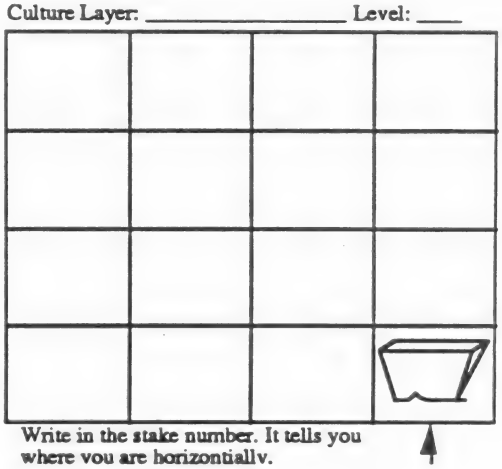
Write in the stake number. It tells you where you are horizontially.

Culture Layer: _____ Level: ____



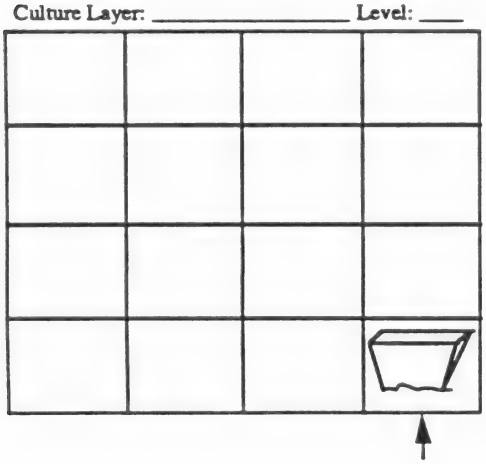
Write in the stake number. It tells you where you are horizontially.

Culture Layer: _____ Level: ____



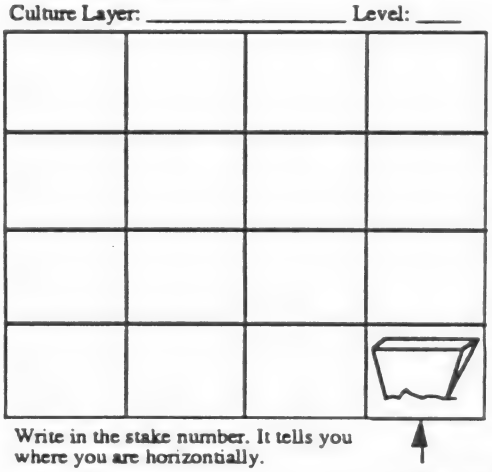
Write in the stake number. It tells you where you are horizontially.

Culture Layer: _____ Level: ____



Write in the stake number. It tells you where you are horizontially.

Culture Layer: _____ Level: ____



Write in the stake number. It tells you where you are horizontially.

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Clovis Culture

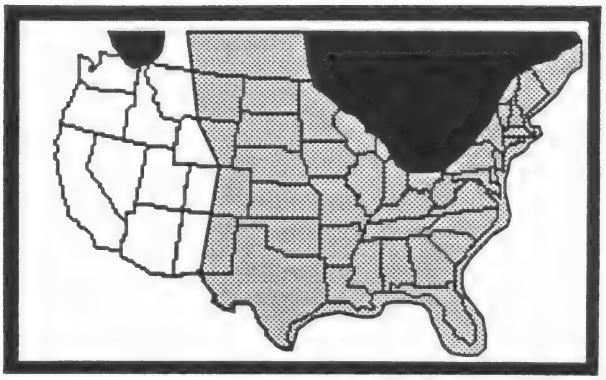
Dates: 10000-9000 BCE/BC

Major Sites: Clovis, NM; Shoop, PA; Bull Brook, MA; Williamson, VA

The Clovis culture was part of the Big-Game Hunting Tradition. It is one of the earliest cultures we can identify in America. People who lived during these times are often called "Paleo-Indians" which means "Old Stone-Age Indians." The Clovis people lived in most of North America, from the Rocky Mountains to the Atlantic Coast. They also lived in some areas that were then above water, areas that have since been flooded because the great glaciers melted. The water from the glaciers caused the oceans to rise about 280 feet (85 meters).

The major food sources of the Clovis people were native horses, mastodons, mammoths, giant beavers, dire wolves, saber-toothed cats, American lions, short-faced bears, camels, peccaries, and curve-snouted tapirs. They also ate small game such as birds, turtles, and rabbits. They ate vegetables, too. We know this from finding the seeds of some wild plants.

Clovis people hunted by throwing or thrusting large, heavy spears. They would try to drive a big-game animal into a shallow lake or bog, where it would get stuck and become helpless. They were not able to kill such large animals easily, so they had to make them bleed to death from many wounds.



The spearpoints of the Clovis people were not like any other point in the world. The fluting or groove was specially designed to help tie the point onto the shaft and also to make a wounded animal bleed faster (so it would die sooner). Clovis points have actually been found in the middle of some mammoth bones.

During Clovis times, the Ice Age was just ending. Strange as it may sound, summers were a little cooler and winters were a little warmer than they are today. It was a little wetter all around Canada and the United States. But it was not only a little warmer and wetter. The climate was actually different. The desert southwest was plush grasslands with many lakes and trees, and southern Canada was also grassy, with plenty of water and wild life. Around the end of Clovis times, weather began to change more to what we are familiar with today.

We do not know if the Clovis culture ended because new people arrived or because the same people just began to do things differently.

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Plano Culture

Start: 8000-7000 BCE/BC

Major Sites: Hell Gap and Cody, WY; Graham Cave, MO; Great Lakes area, north of the Ohio River

The Plano culture was part of the Big-Game Hunting Tradition, though the only real big game left was the mastodon. When most big-game animals became extinct, the Plano people no longer used fluted points. The new type of point used, called a "lanceolate" (LANN-see-uh-late) point, means "long, thin, and pointed at one end."

Earlier people used a knapping (stone-breaking) technique called percussion flaking, with which they made sharp edges by hitting a stone (like flint or chert) to chip off small flakes. The Plano people used a new chipping technique called pressure flaking. They did not hit the target stone, but applied pressure in just the right spot with a bone instrument. The knapper (person making the point) applied more and more pressure until a chip of stone was forced off the point. The new method let the knapper take off smaller chips, which produced a smoother and sharper edge. Plano points have some of the best knapping done in America.

The Plano people made many of their knives by chipping the stone. They used these along with the older style flake knives. Refer to the information sheets on "Chipped Knife" and "Flake Knife" to read about the differences between these two tools. Plano people made a number of other types of stone tools, including scrapers, perforators, choppers, pounders, and rubbing stones.

The pounding and rubbing (or grinding) stones are very important archaeological finds because they prove beyond any doubt that the Plano people also ate plant foods. They used these milling and grinding stones to crush seeds and nuts that they had gathered.

Plano people ate new kinds of meat: deer, raccoon, opossum, and shellfish. The bighorn bison continued to be important, but people also hunted the modern bison.

Plano people were the last of the true big-game hunters.

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Archaic (Middle and Late) Culture

Dates: 5000-1000 BCE/BC

Major Sites: Eva, TN; Green River, KY; Lauderdale, AL

The Archaic Period lasted a very long time. During this time, people made some of the most important advancements in history: in tool-making, hunting, domesticating animals, and in the first steps toward agriculture north of the desert Southwest.

They made new types of ground- and polished-stone items. Many were non-utility items such as decorative stone pendants and ceremonial objects. Other included birdbone beads and animal teeth. Some new stone tools were grooved axes, adzes, and gouges. People used many of these new tools in woodworking, a major craft of people living in a forest environment.

These people used an advanced hunting weapon, a light spear with fletching (feathers) to increase accuracy. This is a "dart," a large arrow rather than the tiny thing we use today to play darts. Hunters used the "atlatl," or throwing-stick, to throw darts. They weighted the atlatl with a bannerstone or a boat-stone to give the dart an extra push when thrown. They carved bone items, such as the hook on the end of the atlatl that held the dart in place.

Archaic people hunted deer, elk, bear, fox, wolf, squirrel, raccoon, beaver, opossum, otter, turkey, and other birds. They collected mussels from the rivers and fished with bone fishhooks.

People of this era may have been the first in North America to domesticate the dog.

Archaic people traveled to seasonal semi-permanent camps, from one food source to another. They probably used the same routes each year. This was the beginning of people settling down to live in permanent villages. They also began agriculture in the eastern woodland. At first, they crushed wild seeds and grains with milling and grinding stones. In the Late Archaic Period (the final thousand years), they began farming sunflowers, goosefoot, and Jerusalem artichokes.

Late Archaic people began to make copper beads, tube-shaped pipes, and bar gorgets. Some Archaic styles survived until the arrival of the Europeans.

mecc

Hopewell Culture

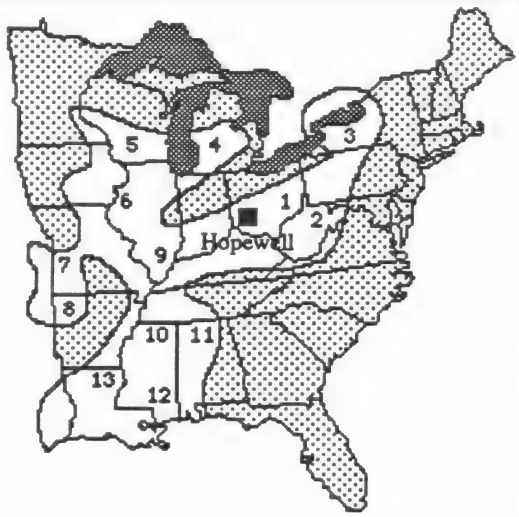
Dates: 300 BCE/BC-700 CE/AD

Major Sites: Hopewell Mound, OH

The Hopewell culture was the second part of the Woodland Tradition. It is also called the Burial Mound II Period. Hopewell culture was very similar to Adena culture, only on a larger scale. It had more and bigger mounds, more and finer arts, more trade, and better farming.

The Hopewellians buried an enormous amount of wealth with their dead. They made these burial items of many different materials from all over the continent. Earlier people had trade routes, but nothing as great as the Hopewellians. They had the largest trade network that ever existed in ancient North America. They got materials from Ontario (Canada), the Great Lakes area, the Appalachians, the coasts of the Atlantic and the Gulf of Mexico, and the Rockies.

Hopewellians made intricate cutouts from copper and sheets of mica. Artists carved designs in copper sheets, stone tablets, and the shells. Craftsmen covered numerous items with thinly pounded copper and silver leaf. Sculptors carved beautiful tobacco pipes in the shapes of animals, people, and birds. They shaped stone, not only into dart points but also into flake and chipped knives, ear spools, polished axes, atlatl weights, gorgets, engraved "marbles," and horned serpents.



1. Ohio Hopewell
2. Armstrong Hopewell
3. New York Hopewell
4. Goodall Hopewell
5. Trempeleau Hopewell
6. Havana Hopewell
7. Kansas City Hopewell
8. Cooper Hopewell
9. Crab Orchard Hopewell
10. Miller Hopewell
11. Copena Hopewell
12. Porter Hopewell
13. Marksville Hopewell

Hopewellians were the first eastern American corn (maize) farmers of whom we have proof. Other staple crops from Central America also made their way into Hopewell fields. Like Mexicans and the Pueblo peoples, these northerners used a complete farming system. Cornstalks gave beans a place to climb. Beans put back the nitrogen that corn took out of the soil. Squash grew wildly over the area near the corn and beans, shading the soil and slowing down the growth of weeds.

Hopewellians also made a musical instrument called a panpipe out of reeds. And, like the Adenans, they wove cloth out of wild plant fibers.

mecc

Frontier Culture

Dates: 1700-1810 CE/AD

Major Sites: Fort Harrod and Boonesborough, KY

In American history, the term *frontier* is usually used to mean "the border between settled and wild country." But all of America was always settled—either by Indians or by Europeans. Therefore, we should use the term *frontier* to mean "the boundary between two nations." The American Frontier was always the border between American Indian and Euro-American territory.

Indians cleared land for agriculture, but left the rest of the forests and plains so that animals and other resources, such as medicinal plants, could thrive. White settlers had a different way of using the land. They worked very hard at clearing all of the forests for farms, log homes, and forts. One reason for this was that there was a very large and expanding population of Euro-Americans, who always needed more land.

Even so, settlers learned many things from the Indians. They grew corn and other garden crops. They fished and they hunted deer and elk. They caught geese, ducks, and turkeys. They also used local herbs, nuts, wild grapes, and wild berries. On very hot days, men often copied the Indian habit of dressing only in a breechcloth.

Settlers also kept many items that had originated in Europe, including candles, cheese, tea, chickens, pigs, cows, farming and household utensils, forts, and schools.

The land was rich and fertile. Wild grass and clover was good food for pigs and cows, so the settlers kept the animals in the woods, where they would be free to eat. Each day women would milk the cows while men stood guard against Shawunogi (Shawnee) attacks. The Indians fought the whites because they viewed them as invaders.

Whites first lived in houses connected by a stockade fence—a "fort." The houses had windows made out of very thin doeskin membrane. Soap makers, carpenters, blacksmiths, launderers, teachers, and guards all did their jobs inside. Men made usable fibers from flax stalks. Women made dyes for cloth from tree bark and nuts. They also spun the flax fibers into thread, then wove them into homespun linen.

mecc

Civil War Culture

Dates: 1860-65 CE/AD
Major Sites: Bowling Green and Perryville, KY

The Civil War was one of America's great tragedies. Americans fought over two major issues, slavery and union. People from each part of the nation were on both sides of the issues.

Confederate States of America
United States of America
Border States (Pro-slavery, did not secede)
Seceded from Virginia to stay in USA
Territories

The South had a stable, slavery-based agricultural economy, hardly changed since the American Revolution. Some Southerners wanted to end slavery and build an industrial economy. Most wanted to keep the plantation culture and were willing to break up the United States to do so. They claimed that a state had the right (therefore, "states' rights") to govern itself, even to secede and form another country if the present government was unsatisfactory.

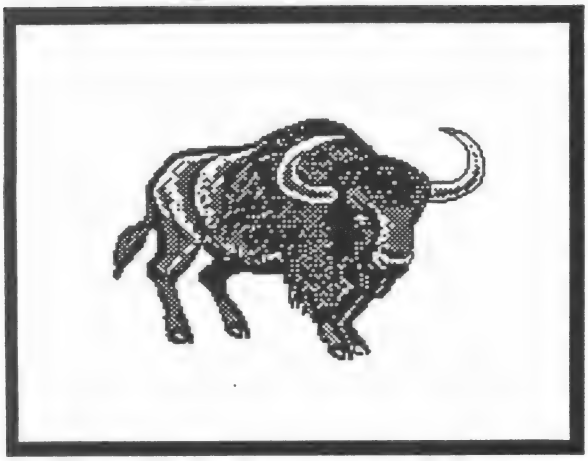
Many Southerners firmly believed in the union. Throughout the war, Confederate officials worried about the pro-union people in eastern Tennessee, the western Carolinas, and northwest Georgia. West Virginia actually seceded from the Confederacy and formed a new state in order to remain in the union!

The North would not let the union be broken up. It had a rapidly expanding, money-based shipping and industrial economy. The South was a major market for industry, and shippers made a lot of money transporting Southern crops (especially cotton and tobacco) to other parts of the world. Industrialists did not want slavery. They needed labor that would actually cost less than the food, housing and health care of slaves. (Many Northerners, however, believed that blacks should never be allowed equal status with whites.)

In many areas, such as Kentucky, people within the same family took opposing sides. Relatives actually fought each other. There were no battles here, but Union (Northern) forces camped on the Bluff. Confederate (Southern) cavalry passed nearby on some daring raids.

Many African-Americans and Native Americans fought in the war. The Lenni Lenape (Delawares) fought on the Union side. The Chikasah (Chickasaws) and Chahta (Choctaws) fought with the Confederacy. Some Muskogi (Creeks), Chalagee (Cherokees), and Simanole (Seminoles) fought on each side. These last five Indian nations lost more people in the war than any state that fought.

Bighorn Bison



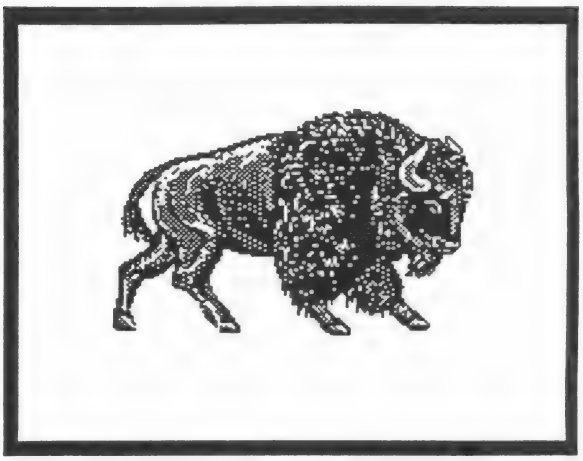
Size: 2.5-4.6 m tall; 8.0-15.0 ft. tall

Culture: Cumberland, Plano

Bison are American members of the same family as sheep, goats, cattle, water buffalo and antelope. Bighorn bison, an ancient big-game animal, lived until the end of the last ice age. Like all its relatives, it chewed a cud—already half-chewed food that had been stored in one of its stomachs.

The horns of the bighorn bison were very wide and dangerous for early hunters. Like other animals from its family, the bulls probably attacked whatever they thought was a threat. Rather than hunting bighorn bisons, people often drove herds over cliffs to kill them for the meat. Then, because so many animals were dead, the hunters only took the best pieces of meat from each carcass, leaving the rest to rot. This type of slaughter became less common (but did not disappear) after the bow and arrow was invented.

Modern Bison



Size: 2.1-3.0 m tall; 7.0-10.0 ft. tall

Culture: Transitional, Archaic, Adena, Hopewell, Fort Ancient, Frontier

The modern bison is the "buffalo" of the American West. It was the most important animal for Indians after all the "big game" became extinct. It continued living in the eastern U.S. until after Europeans arrived. Some of the earliest whites in Kentucky hunted bison from the herds there. Bison in the east grazed on grass but also ate leaves from the trees. Bison on the plains only had grass to eat.

The bison were a major source of raw materials for the Plains nations. They provided meat; hides for clothing, tipi covers, and blankets; bones and horn for tools; sinew for bowstrings and thread; and fat for many uses. They remained important for Plains Indians until the late 1800s, when the U.S. government urged white hunters to kill them so Indians could not use them. The bison almost became extinct. Some ranchers now raise them, and "buffalo meat" is available in some stores.

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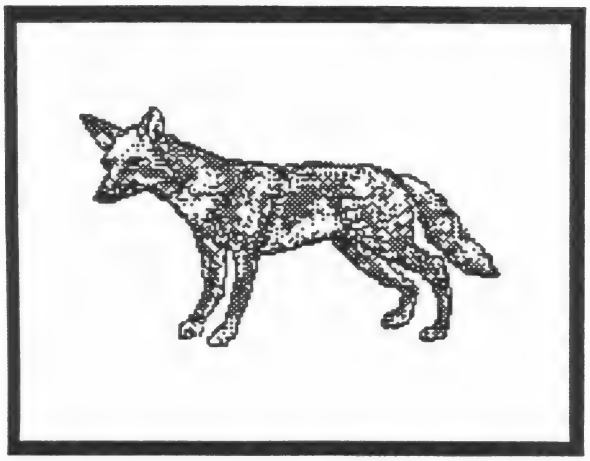
Dog



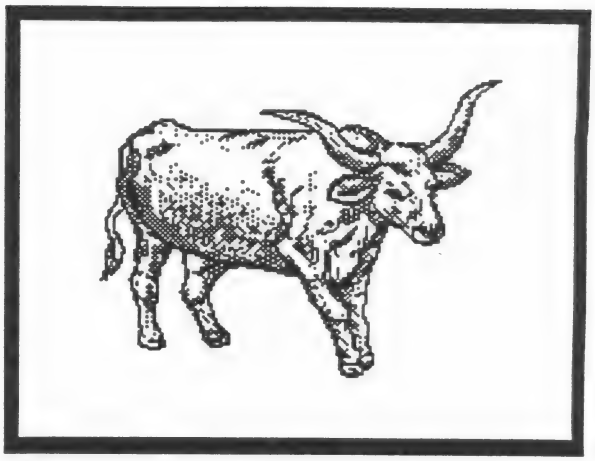
Size: 0.4-0.6 m tall; 1.5-2.0 ft. tall

Culture: Archaic, Adena, Hopewell, Fort Ancient, Frontier, Plantation, Civil War

Nearly every group of people on earth domesticated the dog. American Indians had the dog from about 5000 BCE. Dogs were buried with humans in Archaic times. Ancient Indians used dogs as pets and as guard animals, just as people do today. Most Indians used dogs to pull heavy loads. Many native peoples ate dog meat; others would not touch the meat even if they starved.

American dogs probably came from coyote stock. When Europeans first arrived, they noted that Indian dogs looked very much like coyotes. Wolves, coyotes, jackals, and all breeds of dogs are very closely related. They can even mate with each other and produce fertile offspring. Coyotes would come close to campsites to eat meat scraps and chew on bones. Since people love young animals, someone probably took in coyote puppies and a few grew up tame.

Cow



Size: 1.2-1.5 m tall; 4.0-5.0 ft. tall

Culture: Frontier, Plantation, Civil War

Europeans brought cattle to America. Colonists generally kept cows for their milk. People preferred to eat pork and wild game. They rarely ate beef. Steers are male cattle that are fixed so they cannot reproduce. Oxen are steers used as work animals. Pioneers found that oxen lasted longer than horses when pulling wagons on trans- continental treks.

Americans began to use cattle for meat only when there were too many animals. Beef came to be a favorite food. A growing Texas cattle industry could only provide hides and tallow (fat) because meat spoiled in shipment. It was only after the Civil War that railroads permitted shipment of live cattle to cities where the animals were butchered and used. The cattle industry grew tremendously. Ever since, cattle have been an important resource for European-Americans and many Native Americans.

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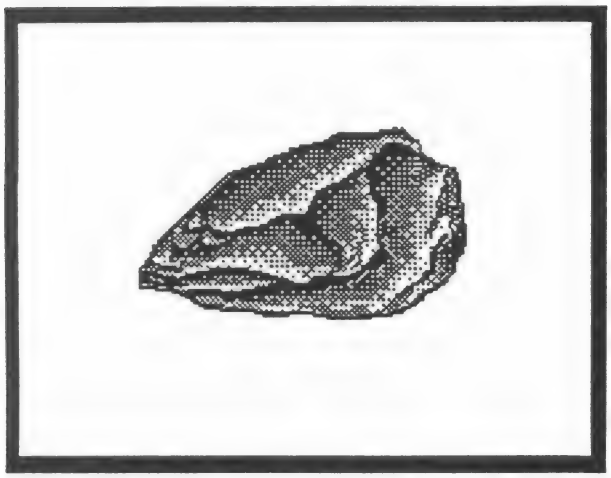
Stone Sidescraper



Size: 6.0 cm wide; 2.4 in. wide

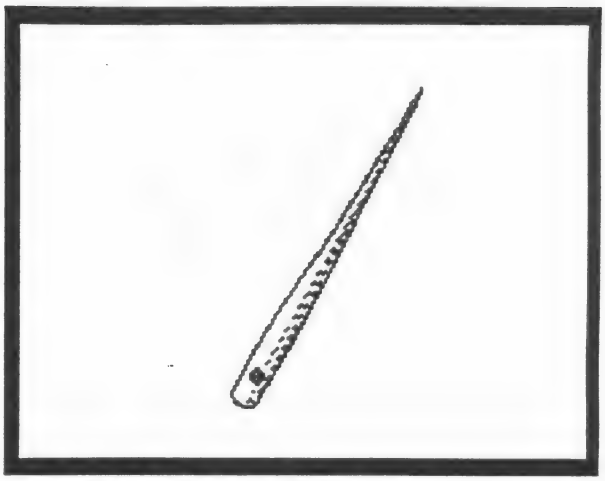
Culture: Clovis, Cumberland, Plano, Transitional, Archaic

The stone sidescraper was a very old tool. People made it the same way they made choppers, primarily by percussion flaking in the earlier eras and by pressure flaking in later times.

After skinning an animal they had killed for food, people used the hide for clothing, blankets, and other things. But a new hide had a lot of fat and hair stuck to it. Women stretched the hide out and tied it to stakes they pounded into the ground. This kept the skin pulled taut while they scraped off the fat and hair with a number of different kinds of stone scrapers.

After they scraped the hide clean, they tanned it into leather. The best tanning method was to rub the brains of the animal into the hide. Every animal's brain provided exactly enough material to properly tan the hide.

Clothes-Making Tools



Size: 9.0 cm long; 3.5 in. long

Culture: Cumberland, Plano, Transitional, Archaic, Adena, Hopewell

Women used several tools to scrape and tan hides and make clothing.

They used needles made from bone or antler. Sewing thread was sinew from hunted animals or twisted fibers from plants. People also used the awl—a kind of needle without an eye—to pierce hides. They could then lace leather or hide pieces with holes together using shoelace-sized strips of leather.

To make a needle or an awl, the toolmaker first splintered the bone or antler and broke off a long thin piece. He or she then rubbed the splinter on a rock until the new item was smooth and had a very sharp point on one end. To complete the needle, the toolmaker used a burin (a type of stone drill) to bore a hole for the eye.

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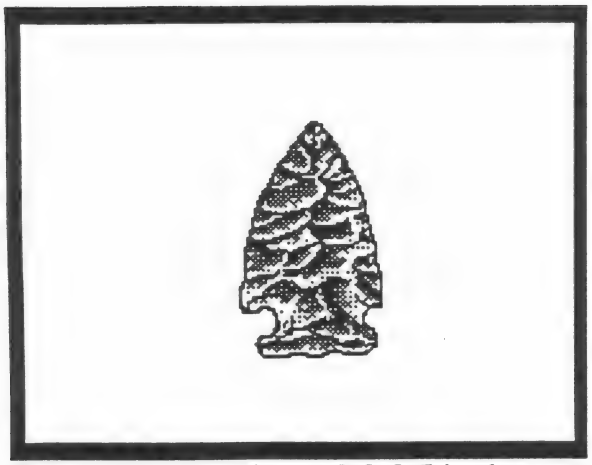
Dart Point



Size: 5.0-9.0 cm long; 2.0-3.5 in. long

Culture: Archaic, Adena, Hopewell

This was the tip of a small spear, called a "dart." The point was often made of obsidian, a stone imported from the Rocky Mountains. A dart was 3 to 4 feet long (0.9-1.2 m). It might have had fletching (feathers for stability) on the back, especially in later times.

Hunters may have simply thrown darts in early times, much like they had thrown the older spears. Later they definitely used an atlatl (a word from Nahuatl, the Aztec language, meaning "spear thrower"). An atlatl was a specially shaped stick with a hook on one end. The hunter held the atlatl alongside the dart, with the hook tucked into the back of the dart, behind the fletching. It made the hunter's arm "longer." As the hunter threw, he kept hold of the throwing stick when he released the dart. This gave the dart more power, speed, and range—all very important in hunting.

Atlatl Weight

Size: 10.0 cm wide; 3.9 in. wide

Culture: Transitional, Archaic, Adena, Hopewell

This was an important part of the old spear thrower, or "atlatl." Depending on its shape, the weight is called a bannerstone, birdstone, or boatstone. The picture above shows a bannerstone. Birdstones resemble carvings of waterbirds floating on the water. Some boatstones look like a submarine when viewed from the side. Indians invented the atlatl about the same time as Europeans did.

For a description of using an atlatl, see the article about the "Dart Point" to the left. When the hunter threw a dart, the weight helped the wooden atlatl to whip around with great force. The atlatl then pushed the dart with high power and speed. This allowed hunters to hit animals from a greater distance.

Dart throwing is also a modern hobby. People make their own atlatls and darts and compete in target throwing. A well-thrown dart can hit a ten-centimeter mark from 40 meters away.

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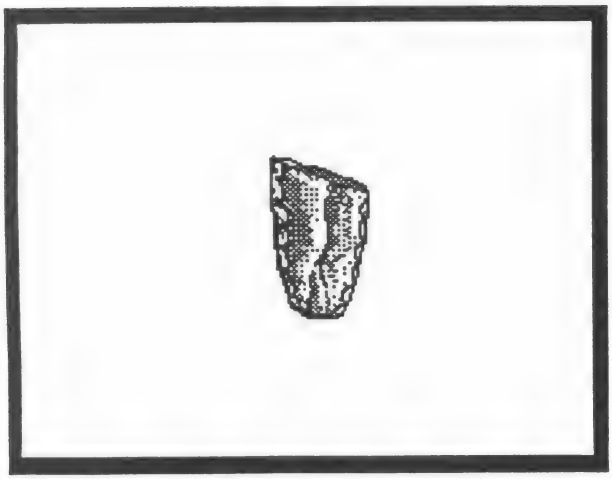
Flake Knife



Size: 2.5 cm long; 1.0 in. long

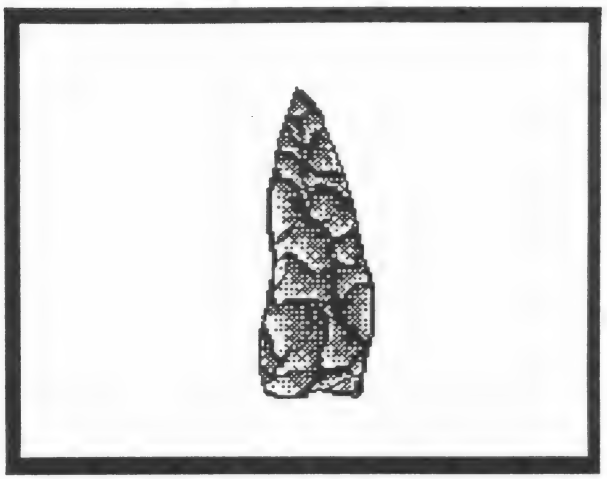
Culture: Clovis, Cumberland, Plano

The flake knife was probably the first type of knife. People made it from special kinds of rocks that break in certain ways when hit. They imported obsidian, a volcanic glass, from the Rocky Mountains. They got other types of rock, such as chert and flint, from other places.

The knapper (stone worker) started with a specially shaped piece of rock called a "core." When the knapper hit the core just right, a long, thin "flake" broke off.

When the flake broke off correctly, its edges and tip were very sharp. Later knappers learned to retouch the flake. This means they chipped smaller pieces off the edges to make them even sharper. This was the beginning of chipped-stone technology.

Chipped Knife



Size: 4.0 cm long; 1.6 in. long

Culture: Plano, Transitional, Archaic, Adena, Hopewell, Fort Ancient

Over a long period of time, stone-workers learned that they could sharpen the edge of a flake knife by a process of chipping off one little piece of stone at a time in exactly the right place. This is called "knapping."

A chipped knife was a big advancement over the flaked knife for a number of reasons. First, it was sharper. If the original flake did not break off of the core with a real sharp edge, it could be chipped so that it was sharp. Thus, there was less wasted material. Finally, chipped tools could be sharpened by rechipping.

Chipped stone is finding new applications in modern times. Because it does not get dull when it chips like steel does, some surgeons are beginning to use chipped obsidian scalpels.

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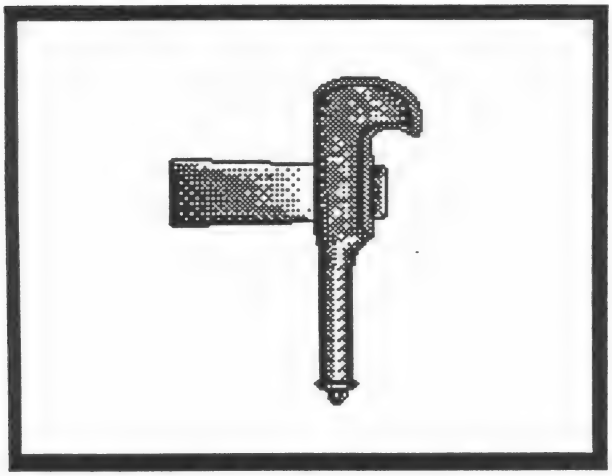
Ground-Stone Axe



Size: 16.0 cm long; 6.3 in. long

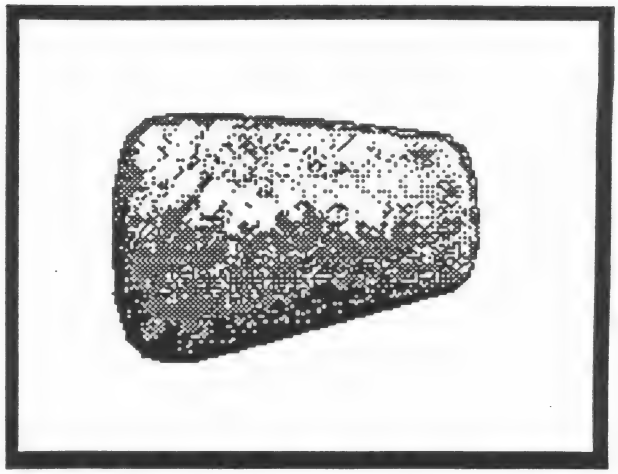
Culture: Archaic, Adena, Hopewell, Fort Ancient.

The ground-stone axe was a very advanced tool. The toolmaker rubbed a rock against another rock to wear it down until it had a sharp edge. This took a long time and a lot of work, but the result was worth the effort. This axe could cut down even the largest trees without becoming dull.

Most ground-stone axes for daily use were rather plain looking. Many had a shape similar to modern hatchet heads. The axe shown in the picture was a ceremonial or burial item. Its bands and ridges took an extra long time to make. But people have always put extra time into their special items.

In later times, ground-stone techniques were also used to make atlatl weights and other artifacts. Many ground-stone items were also polished stone that were rubbed until very smooth and shiny.

Meteoric-Iron Axe



Size: 6.0-8.0 cm long; 2.3-3.2 in. long

Culture: Hopewell

Some ancient American peoples pounded copper, and others even melted and cast copper items. But no Native Americans ever melted iron from ore or made steel.

However, they often found iron meteorites and hammered them into useful tools. Sometimes they hammered the cold metal. At other times they heated the metal first. These same cold- and hot-hammering methods had also been used by the Archaic peoples.

Hopewellians made some important tools out of such hammered iron (and also out of copper). Meteoric iron axes and adzes were extremely useful for woodland people. (An adz is a special tool for shaping wood, kind of an axe set sideways.)

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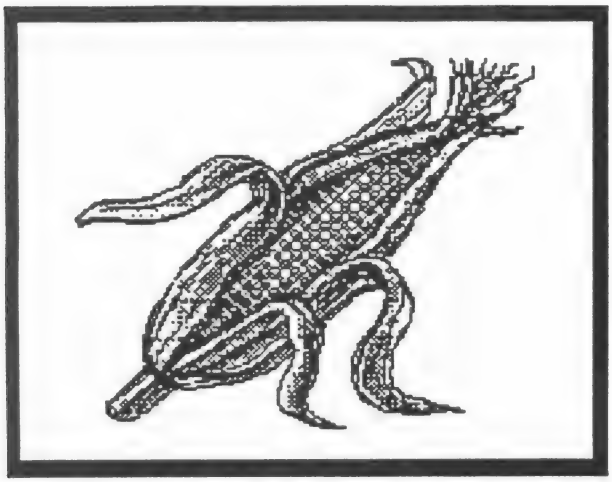
Corn (Maize)



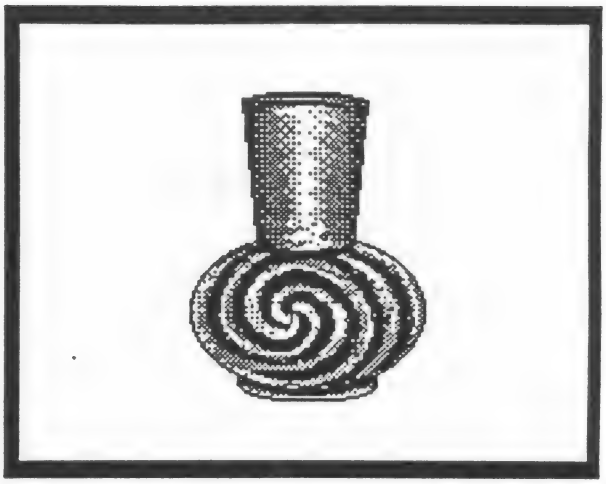
Size: kernel: 1.0-1.5 cm long; kernel: 0.4-0.6 in. long

Culture: Hopewell, Fort Ancient, Frontier, Plantation, Civil War

No one knows how humans began to be farmers. Perhaps food gatherers, who were the women (the men were the hunters), saw that when they dropped some grains, new grain grew the next year. But if they picked up every grain, nothing grew later. Perhaps they purposely planted grains and returned later in the year to gather the crop. Then they settled near the crop to spend more time with it to get better yields. This transition to farming took thousands of years.

Corn (maize) was a food source that Mexican Indians began to cultivate about 5000 BCE. It can no longer grow wild. People must take the seeds from under the husk and plant them. Bluegrass Bluff people started growing corn about 1000 BCE, but it was not a true high-yield crop until Hopewell times (c. 400 BCE). Indians used many types of corn. This made it more likely that bad weather and plant diseases would not ruin the entire crop.

Pottery



Size: 9.0-40.0 cm wide and 3.5-15.7 in. wide and high

Culture: Adena, Hopewell, Fort Ancient, Frontier

Pottery is a companion of agriculture. It appeared at the very end of the Archaic period, between 1000 and 2000 BCE. It became widespread during and after Adena times. People used baskets before pottery. Pottery was waterproof, so even if the pot got wet, the grain stored inside was not ruined. Pottery with tight-fitting lids was also insect- and rodent-proof. This was the long-term storage that farmers needed.

People made pots in many different ways. Some early pots were simple and not well made. Later pottery was excellent work that often included beautiful geometric designs or drawings of animals. Other pots were made in the shapes of human heads, with great detail. Each culture made its pottery differently with various shapes and designs. Look at the suggested reference materials to find out more details.

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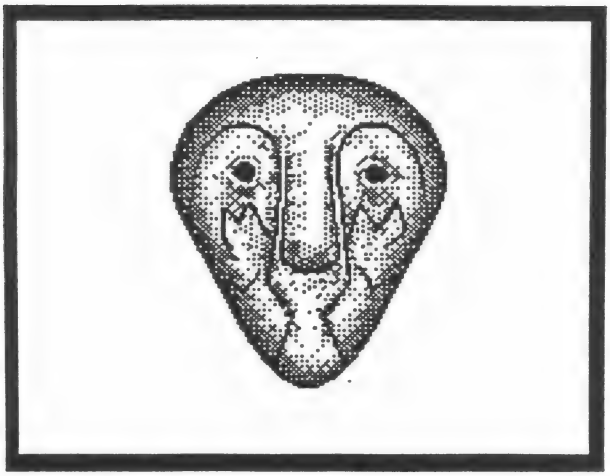
Engraved Seashell



Size: 15.3-20.0 cm long; 6.0-8.0 in. long

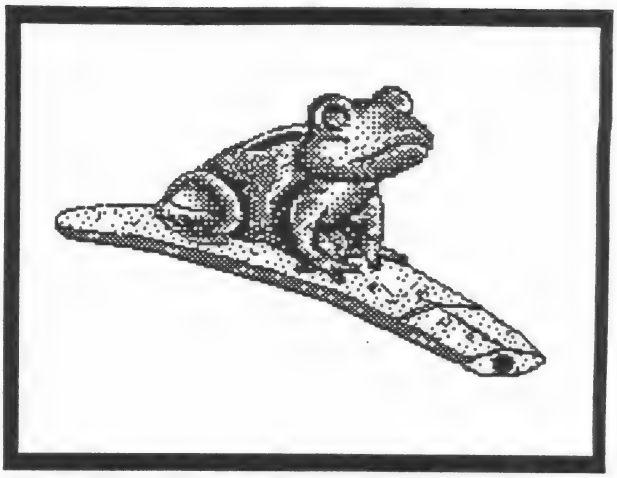
Culture: Hopewell, Fort Ancient

For some people, shell carving was a major artform. Traders brought shells inland from the Atlantic Ocean and the Gulf of Mexico. These shells were usually from an animal called a "conch."

Artists engraved seashells with many different figures and designs. The design might be a bird, a geometric design, or a human hand with an eye or a cross in the palm. The last two were spiritual symbols. The cross represented the four directions. (Four is still a special number for many of today's Indian people.) Most often the design was a full-bodied human figure.

People used the large end of the shell to form a cup with engravings on the outside. They also made gorgets and ceremonial items. Some designs were incised, some cut all the way through the shell (like cutouts), and some carved in bas-relief similar to modern cameo.

Stone Pipe



Size: 8.0-18.0 cm long; 3.2-7.1 in. long

Culture: Adena, Hopewell, Fort Ancient, Frontier

Early Americans used tobacco in sacred ceremonies. (Today's Indian people still do.) People often smoked from plain stone pipes.

In some cultures, especially Hopewell, people made ceremonial pipes in effigies (figures) of such beings as humans, frogs, bears, or birds. The effigy was carved in full round sculpture on the bowl. The tobacco cavity was in the back of the figure.

One Adena pipe is a statue of a man with his hair in a topknot and wearing earspools in his earlobes. If you put the man's face down, you can see the bowl at the back of his feet and the mouthpiece on the top of his head.

Modern Indians use a plain bowl. If it has any carving at all, it is only with incised geometric designs.

mecc

Freshwater Pearls

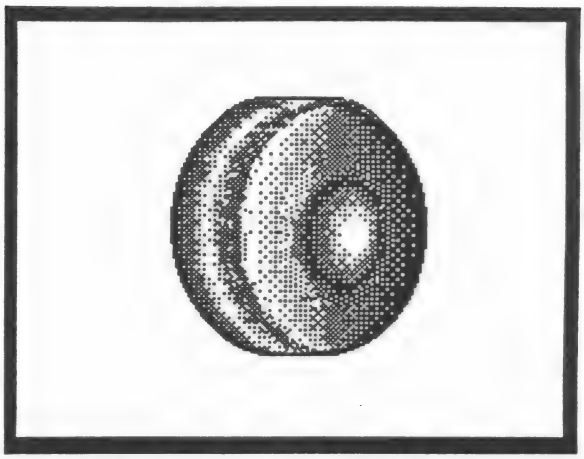
Size: 0.5-1.0 cm diam.; 0.2-0.4 in. diam.

Culture: Hopewell

Shellfish from the rivers provided pearls. People piled them around bodies in burial sites. In one Ohio mound, a body was surrounded by 12,000 unperforated pearls and 35,000 pearl beads.These pearls do not have the high quality wanted for jewelry in today's market, but they were valuable if for no other reason than the time it took to collect them.

For many Indians, giving away things was (and is) not just a sign of power or wealth, but a way to share. The early Siouans may have been part of the Hopewell and Mississippian people. Among the Lakota (Sioux) in the 1800s, nearly everything was given away when a family member died. Today, many people hold a large give-away within a year of a death. The more honor the deceased person had in life, the more gifts the relatives give as a memorial after death.

Chunkee Stone



Size: 10.0-12.0 cm diam. / 4.0-5.0 cm thick; 4.0-4.7 in. diam. / 1.5-2.0 in. thick

Culture: Fort Ancient, Frontier

Chunkee was a game. Indians still played it after Europeans came to America. In 1832 the artist George Catlin even painted a picture of Numa-kaki (Mandan) men playing the game. Muskogi (Creek) men played the game in the central plazas of their towns.

One player rolled the stone along the ground. Others threw a spear or pole to the spot where they thought the stone would stop. The winner was the person who came closest. Some people used a stone with a hole in the center.

In a variation of this game, called the hoop-and-pole game, players actually tried to get a pole or a spear in the hole of the target. Often the target of hoop-and-pole was not a stone, but a ring. Sometimes the wood or cane ring was open and sometimes it had a net-ting that covered most of the opening.

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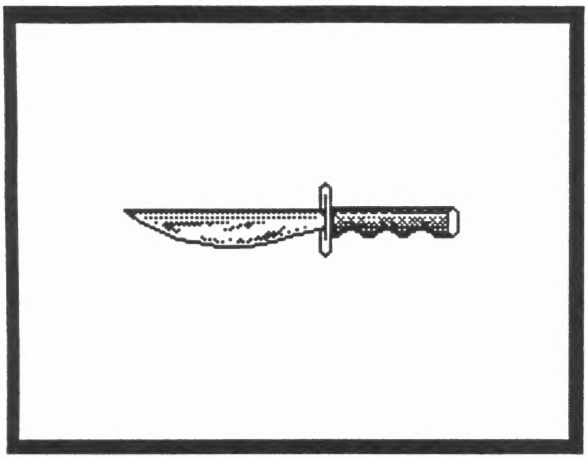
Steel Knife



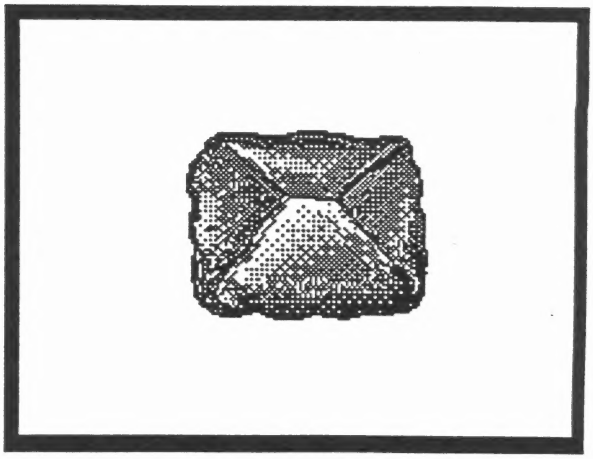
Size: 20.0 cm long; 8.0 in. long

Culture: Frontier, Plantation, Civil War

Europeans brought steel implements to America. Native Americans used pounded copper and pounded meteoric iron for a long time. But they never developed the techniques for smelting iron ore to get pure iron and then to make steel from it. One reason may be that when humans have tools that already do what is necessary, they rarely look for different ways to do things. Elsewhere, metal-making may have been the result of accidents. Nobody knew enough to look at raw copper or iron ore and say, "If I melt that, it will give me a stronger metal."

The major advantage of steel knives over chipped stone was that the steel did not break as easily as stone did. But glassy stone such as chert and obsidian actually stays sharper because when chips break off, the remaining edge is still like a razor. (A broken glass or bottle is sharp no matter where it breaks.) When iron or steel chips, it forms dull, jagged pockets.

Gun Flint



Size: 2.5 cm long; 1.0 in. long

Culture: Frontier, Plantation

The gun flint was an important part of the old flintlock gun. People found out long ago that when you strike some rocks with iron or steel, you can make sparks. This is one way people make fire. It is the basic principle of the cigarette lighter.

The gun flint was part of the old style "flintlock" musket. A piece called the "hammer" held the flint. The hammer was spring loaded. When a hunter pulled the trigger, the hammer snapped forward causing the flint to hit against a piece of steel. This caused a spark that ignited the gunpowder and fired the shot. Americans used guns with flints from frontier times until the Civil War.

Percussion weapons replaced flintlock weapons. In these weapons, a firing pin hit a new chemical called a "fulminate," which then exploded. This, in turn, ignited the gunpowder.

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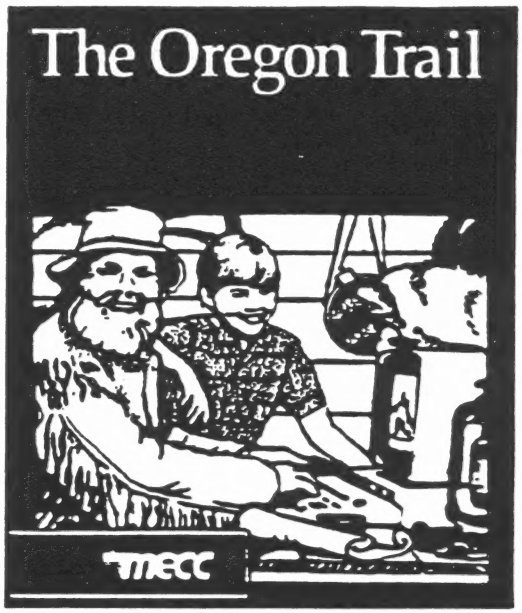

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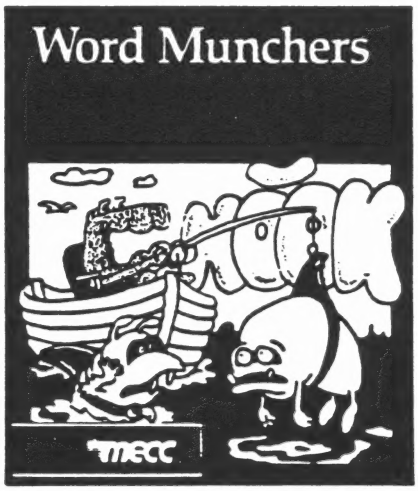

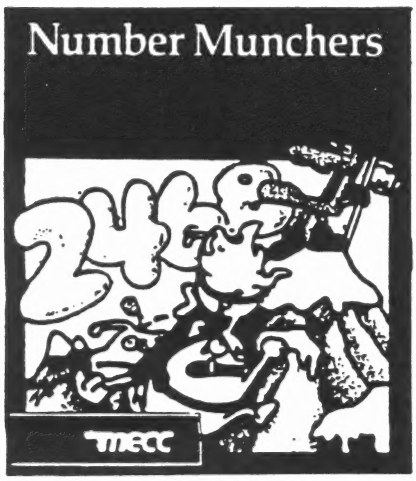

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